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Much

Much

Edwin Thomas

THE ELEMENTS

Mate of the 16th Regiment Foot.

OF

SURGERY.

March the 26th 1763

In which are contained

All the eſſential and neceſſary Principles of the Art; with an Account of the Nature and Treatment of Chirurgical Diſorders, and a Deſcription of the Operations, Bandages, Inſtruments, and Dreſſings, according to the modern and moſt approved Practice.

Adapted to the Uſe of the Camp and Navy, as well as of the Domeſtic Surgeon.

Illuſtrated with Twenty-five Copper-Plates.

By *SAMUEL MIHLES*, M. D.

LONDON:

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TO

JOHN RANBY, Eſq;

Principal SERJEANT-SURGEON
to His MAJESTY,

AND

Maſter of the Worſhipful Company
of SURGEONS;

THIS

Compendium of SURGERY

Is dedicated by

His obedient,

humble Servant,

SAMUEL MIHLES.

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THE ELEMENTS OF SURGERY.

Q. 1. HOW do you define the Art or Profeſſion of Surgery?

A. Surgery is that moſt ancient and apparently uſeful Branch of Phyſic, which treats Diſorders *by manual Operation*, (as the Word originally imports) aſſiſted *with Inſtruments and topical Remedies.* But yet are we not to exclude the Uſe of internal Remedies, with a proper Regimen, *&c.* though theſe are more peculiarly the Province of the Phyſician and Apothecary, as Phyſic now ſtands divided into Three diſtinct Profeſſions. The Surgeon is therefore eſteemed the Phyſician's right Hand, and the Apothecary his Left, without which he cannot relieve diſtreſſed Nature.

Q. 2. What are the Parts of Surgery?

A. It has been uſually divided, according to the Nature of the Operations, into the following Parts. 1. *Syntheſis*, including the Conjunction of divided Parts, as in curing Wounds, Fractures, *&c.* 2. *Diæreſis*, or the Diviſion of Parts joined, as when the Fingers grow together, the opening of Abſceſſes, *&c.* 3. *Exæreſis*, or the Extirpation of morbid Parts, as of foul Teeth, Cancers, Scirrhi, *&c.* 4. *Aphæreſis*, or the Amputation of entire Parts, as of Fingers and Toes, Legs and Arms, Wens, *&c.* 5. *Diorthoſis*, or the Rect-Appoſition of Parts diſlocated or deformed, as in Luxations, the wry Neck, *&c.* 6. *Proſtheſis*, or the ſupplying loſt Members and other Deficiencies by Inſtruments artificially contrived; as artificial Teeth, Eyes, Hands, *&c.* Which laſt is now the Buſineſs rather of the Inſtrument-Maker than the Surgeon. — Others divide Surgery more generally into, 1. the *Pentateuch*; (treating of Wounds, Fractures, Luxations, Tumors and Ulcers); 2. the *Operations*; and, 3. the *Bandages*.

Q. 3. What are the principal Inſtruments uſed in Surgery?

A. Theſe are either for the Pocket, or to be kept in the Cheſt or Study. Among the former are the Caſe of Lancets, ſtrait and crooked Sciſſors, (the latter called Probe-Sciſſors); a Pair of Forceps, a ſmall Razor, a ſtrait and crooked Biſtoury or Scalpel, a ſtrait double-edged Scalpel; Probes of ſeveral kinds, ſome grooved to direct the Inciſion-Knife, others with a triangular or globular Point, and a half Eye; a Spathula, ſtrait and crooked Needles, a Salvatory or Plaſter-Box, *&c.* Choice of which may be ſeen at the Shops of the moſt noted Inſtrument-Makers of *London* and *Paris.* (See the Figures of *Tab.* I.) The Inſtruments for the Cheſt or Study are much larger and more numerous; and therefore it will be more commodious to give the Liſt of them under the reſpective Operations to which they belong. The Lancets ſhould be kept clean and well ſet, neither too long or ſpear-pointed, nor too thin in the Blade; ſome of them forming an acute, and others a more obtuſe Angle for Veins of different Depths and Sizes (*Tab.* III.) The Probe-Sciſſors are uſed to follow the Probe for enlarging the Openings of Abſceſſes, Fiſtulæ, *&c.* though in all Caſes the Sciſſors ought to give way to the uſe of the Scalpel where practicable, inaſmuch as they give more Pain, and make a contuſed Wound by their pinching, in the diviſion of ſoft parts.

Q. 4. What are the common Materials for Dreſſings in chirurgical Diſorders, and after the Performance of Operations?

A. They are Lint made up into various Forms, Compreſſes or Bolſters, Plaſters and Bandage. Even ſometimes Compreſs and Bandage alone make the whole Apparatus, as in many ſimple Fractures, Luxations, *&c.*

Q. 5. What are the Uſes of Lint?

A. Dry Lint is uſed, 1. as the moſt innocent Styptic to reſtrain the Hæmorrhage in recent Wounds; for which purpoſe it is likewiſe in larger Hæmorrhages dipt in ſome ſtyptic Liquor, in Alcohol or in Oil of Turpentine heated, *&c.* 2. Another Uſe of Lint is to heal, or incarn or cicatrize clean Wounds, which it does by abſorbing the Matter in them, and excluding the injurious Air. 3. It is uſed to dilate Wounds, and keep open their external Orifice, till the bottom is cleanſed and healed; as alſo to compreſs and keep down fungous or proud Fleſh, which retards the Cicatrization.

Q. 6. In what Forms is Lint applied for theſe Purpoſes?

A. Sometimes it is applied in a flat or oval Shape, and then it is denominated a Pledget. (*Tab.* II. *fig.* 1, 2.) Sometimes it is convoluted into a cylindric or globular Form, and then it is termed a Doſſil, (*ib. fig.* 3, 4, 5.) which is either applied looſe, or ſecured round the middle with a thread (*ib. fig.* 6, 7.): but when Lint is tied very cloſe together in a conical ſhape, it is then called a Tent (*ib. fig.* 8, 9.); which laſt is of late juſtly brought into diſuſe, as it irritates and renders the Lips of a Wound callous by its Hardneſs and Compreſſure, ſo as greatly to retard the Cure.

Q. 7. But are there no Caſes in which the uſe of Tents may be allowed?

A. If they may be uſed any where, they may in Wounds of the Thorax or Abdomen, to ſtop up and keep open the Perforation, to give a Diſcharge to the confined Blood or Matter; and in this caſe the Tent ſhould be only a bit of fine Rag or Lint rolled up into a Cone, with a downy Apex, and ſecured from ſlipping in by a thread faſtened to its Baſis. But if the Tent is deſigned to dilate ſome narrow Opening, Abſceſs or Fiſtula, *&c.* where the Patient will not permit the Knife; it is then uſually made of Sponge dipped in melted Wax, and kept compreſſed between two Plates till cold, when it is cut as to Size and Shape agreeable to the deſign. Thus the Warmth of the Parts ſoftening the Wax, the Sponge by degrees ſwells and dilates the Opening.

Q. 8. What are the Materials and Uſes of Compreſſes?

A. Theſe are uſually made of Linen folded together, and applied either dry or dipped in ſome Liquor, to make the Bandage and Splints ſit eaſy and preſs effectually upon the Parts, alſo to retain the Dreſſings, and often the Parts themſelves in their due Situation. When the Compreſs is to make a conſiderable Reſiſtance, as in many Fractures and Luxations, it is often made of a piece of Emplaſter folded together: ſometimes a farthing Ball filled with ſaw-duſt is uſed, to retain the Head of the Humerus, and a farthing itſelf is folded up in a bit of rag to compreſs after Arteriotomy in the Temples, *&c.* They are formed as to ſize and ſhape agreeable to the deſign and part which they are to inveſt. See the various Figures of them repreſented in *Tab.* II. *fig. a, b, c, d, e, f,* &c..

Q. 9. What are the Uſes of Plaſters in Dreſſings?

A. They ſerve to ſecure the Dreſſings or other Applications, to defend Wounds from the Air and other Injuries, to ſecure and retain the Fragments of a Bone; as alſo to eaſe, diſperſe or maturate in Tumors and Luxations, *&c.* Add to this their Uſe as a dry Suture, for retaining the Lips of a Wound together. They vary as to Figure like the Compreſſes before deſcribed, *Tab.* II. *fig. a, b, c,* &c.

Q. 10. What do you intend by Bandage?

A. That which uſually makes the laſt important Article in every Dreſſing; and which conſiſts of clean, old, but ſtrong Linen, free from knots, hems or roughneſs, and cut to a proper length, breadth and ſhape, ſuitable to the diſorder and part to be inveſted.

Q. 11. How many kinds of Bandages do you make?

A. Bandages are either *common*, ſubſurvient to many Parts and Diſorders; or *proper*, ſerving only for one Part or Diſorder: and each of theſe are either *ſimple*, conſiſting of one entire piece; (*Tab.* II. E, I, P.) or *compound*, made up of ſeveral pieces ſewed together, (*ib.* C, D, R.) The ſimple Bandage is again either equal and *annular*, going round the part like a ring, as in Iſſues, &c. (*ib.* D, F.) or unequal and *ſpiral*, where the turns of the Roller ſhift, by gradually aſcending or deſcending upon the part, (*ib.* H, N.) This laſt or ſpiral Bandage is again ſubdivided into three kinds: (1.) The *deloire* or *ſpreading*, where the turns deviate in any degree, more or leſs, provided they remain contiguous, with their edges wrapping over each other, (*ib.* F, H.) (2.) *Rampant* or *creeping*, where the turns of the Roller recede from each other, ſo as to leave large or ſmall ſpaces betwixt each round, (*Tab.* S. *fig.* F, G.) (3.) The *Reinverſed*, which is when either of the former have the Bandage reinverſed or twiſted at each or every other turn, in order to make it ſit tight upon the declivity of ſome Limb, as upon the Femur, Tibia, and Cubitus. Theſe Bandages of the Roller-kind are ſaid to be ſingle or double-headed, as they are rolled up either at one or both ends, (*Tab.* II. H, O.)

Q. 12. What are the moſt ſimple chirurgical Diſorders?

A. As the human Body is an Aſſemblage of Canals of various kinds, conveying reſpective Juices; the moſt ſimple Diſorders that can happen to them, muſt be either an Obſtruction, whence Tumors of all kinds; or a Solution of their Continuity, whence Wounds of all kinds. Fractures are a Species of Wounds in the harder Parts; Luxations are a Species of Tumors, and Ulcers are old cavernous Wounds.

Q. 13. What do you intend by a Tumor?

A. The Enlargement of any Part beyond its natural Dimenſions; which is diſtinguiſhed in a ſoft Part into inflammatory, dropſical and emphyſematous, according as the Veſſels are diſtended either with red Blood, watery Lymph, or elaſtic Air; and theſe again are diſtinguiſhed into cyſtic, where the Humours are collected into a ſort of Bag; or ſcirrhous, where the Humours are dried and compacted into a hard Body. According to different Circumſtances and Parts in which they are ſeated; Tumors are denominated either Phlegmon, Oedema, Eriſipelas, Abſceſs, Gangrene, Sphacelus; Scirrhus, Cancer, white Swelling, Exoſtoſis, Spina Ventoſa, *&c.* of which we ſhall ſpeak in order.

Q. 14. What is a *Phlegmon?*

A. A Phlegmon is an inflammatory Tumor from an Obſtruction and Diſtenſion of the ſanguiferous or firſt Order of Veſſels, attended with Heat, pricking Pain, Tenſion or Reſiſtance, and Pulſation or throbbing. The immediate Cauſe may be any Stimulas urging the Blood on faſter than it can freely paſs through the Anaſtomoſes of the Arteries into the Veins, too great a Thickneſs of the Blood, or too great a Conſtriction or Diminution of the Diameters of the Veſſels from any Cauſe. The Signs of this Tumor are burning Heat, from the violent Attrition of the Blood, which being obſtructed in ſome Veſſels, muſt neceſſarily run more ſwiftly through thoſe that are pervious; and from the Attrition of the red Globules, betwixt the Contraction of the Artery and that of the Heart, by which they are in a manner drove backwards and forwards in the ſame Veſſel.

Redneſs, from a Diſtenſion of the ſmall Veſſels with Blood, which were before inviſible, and from ſome of the red Parts being forced into the ſerous Arteries. Pain, from the great Diſtenſion of the nervous Fibres of the ſmall Veſſels which are ready to burſt. Pulſation or Throbbing, from the violent Diſtenſion of the Arteries.——This Tumor terminates variouſly, according to particular Circumſtances; as (1.) by *Diſperſion*, when the obſtructed Juices are attenuated and carried off into the circulating Maſs without further Injury; (2.) by *Suppuration*, when the obſtructed Blood breaks thro' and diſſolves the Veſſels into Matter or Pus, ſo as to form an Abſceſs; (3.) by a *Gangrene* or Sphacelus, when the Humours corrupt, and Life totally ceaſes in the Part; (4.) by a *Scirrhus*, when the more fluid Parts of the Humours are drained off or evaporated, the Remainder inſpiſſated, hardened, and concreted together with the ſmall Veſſels into a ſolid Body; and from a Scirrhus in a glandular Part follows a Cancer, which is an intermixture of dead and living Veſſels together.

Q. 15. How do you form a reaſonable Conjecture in which of theſe ways a Phlegmon will terminate? *A.* From

A. From conſidering the Patient's Habit, way of Life, and particular Texture of the Part, with the Degree of Violence in the Symptoms themſelves. Such Phlegmons as are ſlight, conſequent from taking Cold, without any previous Indiſpoſition, are moſt likely to diſperſe, if duly treated in proper time; thoſe, following a Fever in groſs Habits, generally ſuppurate; whereas Phlegmons in old and dropſical People, have a ſtrong Tendence to Gangrene and Mortification in a ſoft Part, and to a Scirrhus or Cancer in a glandular Part, which laſt as *Celſus* obſerves may take place in the Bones from a preceding Inflammation. Again, the more diſtant the Phlegmon is ſeated from the Heart, the more prone to a Gangrene; on the contrary, the nearer the Heart the more copious the Juices, and the more numerous the Veſſels are in the inflamed Part, the more liable is it to Suppuration or Abſceſs.

Q. 16. By which of theſe five ways (*Q.* 14.) are you to aſſiſt Nature, to terminate a Phlegmon?

A. The two firſt of theſe are always the moſt eligible, more eſpecially the former; that is, ſo to relax the Veſſels and attenuate the obſtructing Humours, as to reſtore the Circulation to its due Freedom and Moderation through the diſeaſed Part, without offering any further Injury to the Veſſels; and this more eſpecially when the Inflammation is ſeated in a Part of the greateſt Conſequence, as the Brain, Lungs, or other Viſcera, from whence the Matter formed in a Suppuration, could be difficultly if at all diſcharged; for in theſe Caſes we have a Licenſe to uſe with the greateſt Freedom the proper means for Diſperſion, namely, Bleeding, cooling Purges, Refrigerants and Diluents, with Revulſives of all kinds. I ſay, we are to make uſe of theſe means more liberally to procure a Diſperſion, as a Suppuration or Abſceſs would be more dangerous and difficult to remedy. Hence it follows as a general Rule, that a Diſperſion muſt be attempted in all Inflammations, where that is practicable; but that if the Inflammation is obſtinate and ſuperficial, the Part of little Conſequence, the Patient weak or with Child, *&c.* in that Caſe the Suppuration is to be promoted.

Q. 17. How do you attempt to diſperſe an Inflammation?

A. 1. By

A. 1. By diſcovering and removing all external Cauſes or foreign Bodies, which compreſs, irritate, or diſtract the Veſſels. 2. By Bleeding plentifully, according to particular Circumſtances. 3. By giving Purges and Clyſters (*vid.* ℞. Nº 1.) which operate briſkly without heating the Body, and repeating them at Diſcretion. 4. By Abſtinence from all animal and groſs or ſolid Food, except Veal or Chicken-broths, made extremely thin; by a plentiful Uſe of Acids and aſceſcent Liquors with Nitre, *&c.* obſerving alſo to confine the Patient to a temperate Air in his Chamber, encouraging Sleep and a calm Temper of Mind. 5. By the Uſe of antiſeptic Cataplaſms and Fomentations, (*vid.* ℞. Nº 2.) with very gentle Frictions, and in ſome Caſes joined with Bliſters, Cupping or Scarification, *&c.*

Q. 18. When and how do you promote Suppuration?

A. If the preceding Means have been uſed without Effect, if the Inflammation is obſtinate or too far gone, and ſeated in a Part acceſſible to the Hand; in that Caſe the impervious Blood and ſtagnating Humours break through and diſſolve the ſmalleſt Extremities of the obſtructed Veſſels, and fermenting together, both Solids and Fluids are formed into a cream-coloured, thick, mild, and inodorous Matter lodged in the Center and ſpreading to the Circumference of the inflamed Part, which is then called an Abſceſs; which I foreſee by the proper Signs (*Q.* 19.), and promote by the proper Remedies (*Q.* 20.)

Q. 19. By what Signs do you know Matter will be formed in an inflamed Part?

A. 1. From the Violence of the Inflammation, and Intenſity of its Symptoms, (to wit, Fever, Pain and Pulſation) ſuddenly remitting, and followed with an Enlargement of the Tumor; which more eſpecially inclines to Suppuration, when ſeated in the adipoſe Membrane. 2. From the Phlegmon ſucceeding after an Exanthematous or inflammatory Fever in a young or middle-aged Perſon of a plethoric Habit, and addicted to high living. 3. From a ſmall Rigor, or Chillineſs and Shivering, followed with an Eaſineſs of the Part, pointing outward, and feeling ſoft to the Touch, *&c.* which laſt are the moſt certain and immediate Signs of Suppuration.

Q. 20. What Remedies are uſeful to forward the Suppuration?

A. Theſe are either external or internal; the firſt include all unctuous and emollient Applications in the Form of Cataplaſm (*vid.* ℞. N° 3.) mixed with a little of the Gums, diſſolved in the Yolk of an Egg, applied warm, and either renewed or kept conſtantly warm upon the Part. Internally, the Intenſity of the Fever, or violent Motion of the Blood, is to be abated by bleeding and cooling Medicines till the Pulſe becomes regular; but in weak Habits where the Pulſe is low, ſtrong Broths, Ale, and cardiac Medicines are proper, in order to prevent a Gangrene, which may as well be the Conſequence of a too languid, as of a too impetuous Circulation in the affected Part. The Pulſe ought therefore to be kept up a little higher than its natural Strength.

Q. 21. When is an Abſceſs to be opened for the Diſcharge of its Matter?

A. As Suppuration is a Diſſolution of the dead and impervious Veſſels, together with the Humours, into a mild Cream-like Matter; and as this Matter corrupts and becomes acrimonious if too long confined, ſo as to become attenuated and abſorbed again into the

Maſs of Blood; therefore in moſt Caſes we ought not to wait for a ſpontaneous Rupture of the Skin or incumbent Fat, which ought to be inciſed, in order to diſcharge the Matter, and prevent it from ſpreading into the neighbouring Parts: but, on the other hand, in ſome Caſes it is adviſable to continue the Suppuration, till the Hardneſs, which is perceivable round the Tumor, abates; becauſe if the Abſceſs is opened before this Hardneſs is reſolved, it may continue crude and ſtubborn, diſpoſing the Parts to be fiſtulous, when it might have been more eaſily diſſolved by a longer Continuance of the confined Matter.

Q. 22. Is the Matter of an Abſceſs always to be brought to a State of Maturity before the Apertion?

A. This cannot be allow'd in ſome Caſes; as when there is Danger of the Tumor's breaking into the Thorax, Abdomen, or ſome other important Cavity; as into that of a Joint, *&c.* where the ſpreading Matter might do great Miſchief, unleſs it is immediately diſcharged.

Q. 23. In what manner do you open an Abſceſs?

A. Always by Inciſion, except ſome large Blood-veſſel is near, or when the Patient will not ſubmit to the Knife; or in caſe of a venereal Bubo or ſcrophulous Tumor, and then Cauſtics often take place of the Knife to advantage; obſerving to make the Opening always in the moſt favourable and depending Part, to facilitate the Diſcharge of the Matter, and always preferring the Knife to the Sciſſors, as the laſt pinch and contuſe the Parts which they divide. The Thumb and Fore-finger are preſſed on each ſide, while the Knife (*Tab.* I. L.) is enter'd into the paleſt and ſofteſt part of the Skin, and continued according to the Courſe of the Fibres, when neceſſary.

Q. 24. What Cauſtic do you prefer, and under what Circumſtances is it to be uſed?

A. For deſtroying ſcrophulous and venereal Indurations of the Glands, which will neither diſcuſs nor ſuppurate, and to expoſe a carious Bone, or open an Abſceſs, the beſt Cauſtic in uſe is the common Lapis infernalis of the Shops, mixed with Soap, and applied after the Part has been covered with a defenſative Plaſter, having a ſmall hole in it, to limit the Action of the Cauſtic upon the Skin: and in this manner the Cauſtic may continue upon the Part about five or ſix hours, to deſtroy a large Gland; to expoſe or lay a Bone bare, about four hours; and for opening Abſceſſes, one, two, or three hours, according to the thickneſs of the Skin, and other Circumſtances. When the Cauſtic has made an Eſchar or Cruſt, the Scab ſhould be mollified before it is taken off, by applying a little freſh Butter or Baſilicon, or rather after the Skin is corroded, the reſt of the Opening may be better performed with the Knife; thus the Matter being diſcharged, I then deterge, incarn and heal, as in clean Wounds.

Q. 25. How is an opened Abſceſs to be dreſſed and treated, in order for a Cure?

A. For the firſt time it may be dreſſed with dry Lint only, or with ſoft Digeſtives ſpread on Lint, if there is no Hæmorrhage. Over the Doſſils of Lint may be laid a large Pledget of Tow ſpread with Baſilicon, which lies much ſofter than a defenſative Plaſter, which frequently inflames and offers violence to the tender and naked Parts in its removal. The ſame Dreſſings are to be continued with a proper Regimen, till the Cavity is incarned by Nature, taking care to let the Dreſſings, particularly the Bandage, ſit as looſe and eaſy upon the Part as poſſible; and in the next place it may be cicatrized when filled up, by the application of dry Lint or deſiccative Powders, always keeping the Margin clean and free from fungous Fleſh, by making a moderate Compreſſure with dry Lint, or by levelling the Surface with *Vitriol. Rom.* vel *Merc. præcip. Rub.* &c.

Q. 26. How often are the Dreſſings to be renewed?

A. The Repetition of the Dreſſings muſt be proportionable to the Quantity and Nature of the Diſcharge; for if the Matter is mild and ſmall in quantity, once dreſſing in twenty-four hours will ſuffice; but ſometimes two or three Dreſſings are required in that time, eſpecially in hot Weather.

Q. 27. What is an *Eryſipelas*, and wherein does it differ from a Phlegmon?

A. An Eryſipelas is an Inflammation in the ſerous Veſſels, as a Phlegmon is in the ſanguiferous; being moſt frequently ſeated in the Skin, and other membranous Parts of the Body. An Eryſipelas inclines to a deep Orange-colour, wanders from one place to another, does not tend to Suppuration, but frequently terminates in Veſicles or Hydatides, containing a ſharp ſerous Liquor, in the Skin of the Face, Neck, Shoulders, *&c.* and being preſſed with the Finger, its Colour diſappears, and then returns; which make the principal Marks whereby it is diſtinguiſhed from a Phlegmon, which is rather confined to the adipoſe Membrane. Hence it is evident, that an Eryſipelas may turn to a Phlegmon, or rather be intermixed with a Phlegmon, whenever the red Blood eſcapes into the ſerous Arteries, and propagates the Inflammation, not only through the Skin and ſmaller Veſſels, but likewiſe into the adipoſe Membrane. This Inflammation generally invades with a ſhivering and ſlight Fever, after ſome Surfeit, violent Exerciſe, hard drinking, or taking cold, *&c.*

Q. 28. How do you treat an Eryſipelas?

A. In the ſame manner as a Phlegmon (*Q.* 16.); only here Bleeding and Purging are to be uſed with more moderation, (as the Diſorder lies more out of their reach) and a greater ſtreſs laid upon topical Applications, eſpecially an Infuſion of *Theriaca in ſp. vin. camph. & aq. calc. viv. āā.* applied with linen rags;

as alſo an Infuſion of the *flor. Sambuc. in acet. Litharg. &c.* frequently renewed; uſing Coolers and diluent Medicines internally at the ſame time, and cautiouſly avoiding fat and oily Subſtances, which being applied to the Skin, obſtruct the Pores, and increaſe the Eryſipelas partly into a Phlegmon; whence, like that, it often tends to a Suppuration.

Q. 29. What kind of Tumor is an *Oedema?*

A. This Term originally ſignifies any ſoft pitting Tumor; but at preſent we make two kinds of it, namely, the Oedema *calidum* and the *frigidum*; though the latter is moſt commonly intended by the term Oedema, when uſed without farther diſtinction.—An Oedema calidum is then an Inflammation ſeated in the lymphatic Veſſels, as an Eryſipelas was ſeated in the ſerous ones; from whence it appears to differ only by being ſeated in ſmaller Veſſels. As a Phlegmon is frequently intermixed with an Eryſipelas, ſo an Eryſipelas frequently joins itſelf with an inflammatory or hot Oedema; and in this ſhape it often appears in the Head and Face under the Title of *Gutta roſacea.* It is to be treated as an Eryſipelas (*Q.* 28.)

Q. 30. What do you underſtand by an *Oedema frigidum*, or an oedematous Tumor?

A. I underſtand by it in the common acceptation of the Term, a cold, indolent, and ſoft or pitting Tumor, from watery Humours diſtending the cellular Membrane, without any alteration in the Skin, except a ſhining Tenſity and Smoothneſs.

Q. 31. What are the principal and immediate Cauſes of theſe oedematous Tumors?

A. They proceed immediately either (1.) from a too poor or diſſolved State of the Blood, when there is too great a proportion of Water and Serum in it, and too great a Laxity of the Veſſels: the former from hard Drinking, Fevers, Hæmorrhages, and Suppreſſion of the Menſes in Women; and the latter from a too great Weakneſs of the Veſſels, and too low an Impulſe of the Heart and Arteries, as in old People; or (2.) from a ſedentary Life; to which add a Compreſſion of any of the Veins, as of the Iliacs in Women with Child; a ſchirrous Tumor in the Abdomen, an Obſtruction of the ſmalleſt lymphatic Veins by intenſe Cold, *&c.* Hence it appears that an Oedema is an Anaſarca or kind of Dropſy in a particular Part; and when accompanied with Heat or Redneſs in the Skin is an *Oedema calidum.*

Q. 32. How do you treat an *Oedema frigidum?*

A. For the Cure of this Tumor, a Regard muſt be had to the immediate Cauſes (Q. 31.) in the Body; in caſe of Weakneſs and old Age, or a dropſical Diſpoſition, proper Corroborants and Cardiacs, eſpecially of the aromatic and nephritic kind, are to be given internally, while externally are uſed Frictions with warm Cloths often repeated, moderate Exerciſe gradually increaſed, the Application of ſtrait Stockings or Bandages, after the Legs and Feet have been fomented with *aq. calc. & alcohol. vini āā* ℥jv. *alumen. rupei* ℥j. at the ſame time making a proper uſe of Chalybeats with the Bark, according to particular Exigences, beginning with ſmall Doſes, and gradually augmenting them; but not too haſtily, which ought to be particularly obſerved in all cachectical or leucophlegmatic Habits, to avoid greater Miſchiefs.

Q. 33. What do you underſtand by a *White Swelling?*

A. This is an oedematous Tumor in the Joints, without Heat or even Pain at firſt, ariſing up after being preſs'd by the Finger like a Sponge, and ſeldom appearing but in the Knees or Ancles. The Nature of it is the ſame with an Oedema (*Q.* 30.), excepting that in theſe Joints the cellular Membrane and lymphatic Veſſels are interwove with many tendinous Fibres and Ligaments. It ariſes chiefly from a cachectical Diſpoſition in relaxed Habits (moſtly of Children), joined uſually with ſome Violence or Strain offered to the Joint itſelf. The Bones here ſeldom continue ſound long, but are uſually affected, together with the ſurrounding Parts, as in a *Spina ventoſa*, from the Acrimony of the confined Lymph and Matter in the cellular Membrane; and it is accompanied with a waſting of the Limb below.

Q. 34. How do you treat the *White Swelling?*

A. As it proceeds principally from a bad Habit in general, recourſe muſt be had to proper alcaline, aromatic, and corroborating Medicines internally, the burnt Sponge with the *panacea Plumeri*, *aqua benedicta*, *&c.* while externally are applied the topical Medicines before recommended for an Oedema (Q. 32.); to which add dry Fumes of Sulphur, with Amber, Gum, Benjamin, *&c.* But when the Tumor is large and inveterate, we too often find it inflexible to all Means. Emollient and antiſeptic Applications commonly increaſe the Diſorder; or even if Inciſion is made through the Integuments to let out the diſtending Humours contained in the Joint, the Tumor commonly returns again as ſoon as the Wound is healed: but this is the only Means we have, in order to reduce the Tumor, by diſcharging the Humours from the Cavities of the Joint and cellular Membrane, to compleat which a ſtrict Bandage is to be applied. Some indeed prefer opening the Tumor by Cauſtic, but both this and the Knife require great Caution in their Uſe and Application to theſe tendinous Parts; and even when the Opening is thus made in a bad Habit, it too often ends in a Caries, Fiſtula, or Gangrene of the Joint, which deſtroys the Patient.

Q. 35. What are the Effects of an irreſolvable Inflammation which does not tend to ſuppurate?

A. In this Caſe the Humours are inſpiſſated, turned into a Solid, and concreted together with the Sides of their containing Veſſels, which then become as ſo many dead and foreign Bodies, more or leſs injuring the Nerves, and other adjacent living or pervious Veſſels. Therefore the Effect of ſuch an Inflammation (if in a moderate degree) will be, in the Subſtance of the Bones, an Exoſtoſis or Node; in the Glands, Scirrhi, incyſted Tumors, Cancers, Buboes, Strumæ, *&c.* in membranons Parts, and in the Skin, Calloſities, Warts, Corns, *&c.* Ganglions in the Tendons.—But if it afterwards tends to ulcerate, from thence follows in the Skin leperous Diſorders, Boils, ſcald Head, *&c.* in the Bones a Spina ventoſa, in a glandular Part a Cancer, *&c.*

Q. 36. How does an irreſolvable Inflammation terminate, when it is more violent, in a fleſhy Part, and does not tend to ſuppuration?

A. The Event will then probably be a Gangrene or Sphaceus, a Caries of the Bones, or a malignant Ulcer, *&c.*

Q. 37. What is a Scirrhus?

A. This is a hard, unequal Tumor, with little or no Pain, ſeated in ſome glandular or membranous Part, formed by an Inſpiſſation of the Humours, obſtructing the excretory Ducts of the Gland, and diſtending the membranous Follicles or Cells thereof, while the more fluid Parts of the Humours are drained off or exhaled. Thus an Inflammation only in ſuch a Part, over-diſtending the Arteries, will compreſs the excretory Ducts, while the Humour is poured in too faſt to paſs through them; whence a Retention, Accumulation, Inſpiſſation, *&c.* until the Cells of the Gland are diſtended almoſt to any given degree, ſo as to compreſs moſt of the interſperſed Nerves and Blood-veſſels in the Subſtance of the Scirrhus.

Q. 38. What Parts are moſt liable to this Diſorder?

A. Chiefly thoſe membranous and glandular Parts which ſupply a viſcid Humour, much inclined to inſpiſſate and harden; as in the Eyes, Noſe, Mouth, Breaſts, Armpits, Groins, Teſticles, Stomach, Bladder, Pancreas, Meſentery, Uterus, *&c.* The Dangerouſneſs and Symptoms of which vary according to the Nature and Importance of the

Part, which is itſelf Scirrhous; and of thoſe Parts liable to be compreſſed or injured by its Vicinity, and as it may in time degenerate into the moſt dreadful of Diſorders, a Cancer.

Q. 39. How do you treat a recent Scirrhus in a good Habit of Body?

A. I firſt attempt to diſperſe it by Mercurials prudently uſed, and chiefly by Unction, with very moderate Frictions, and the dry Fumigations mentioned for a White Swelling (*Q.* 34.), ſupplying the Patient liberally with the Drink of Aqua calcis, a plentiful Uſe of Camphire internally, with lenient Purges repeated at diſcretion; cautiouſly avoiding all violent Means at firſt, which would rather confirm than diſſipate the Diſorder.—If theſe Means fail, and the Diſorder is local, and not likely to return in other Glands, at the Patient's Deſire I extirpate it by the Knife, when that can be ſafely done; or if there is a Tendency to Suppuration after a Fever or Inflammation, even in ſcrophulous Indurations, I ſometimes apply the Cauſtic with ſucceſs. —But if the Scirrhus is inveterate, and appears from its Colour, Pain and Itching to be malignant; and if the Patient's bad Habit and its Situation forbid an

Extirpation of it, in that caſe all cauſtic, ſuppurating and healing Medicines, both externally and internally, muſt be cautiouſly avoided to prevent a Cancer, and recourſe muſt be had to Anodynes and Coolers, as well externally as internally; ſuch as Acetum lithargyritum, an Amalgam of Mercury with Lead; being careful at the ſame time to regulate the Action of the Mercury, that it may not too much increaſe the Momentum of the Blood, and endeavouring alſo to correct the Patient's bad Habit.

Q. 40. Do you approve of Cauſtics to deſtroy a Scirrhus?

A. Theſe irritate, and often threaten a Cancer very much; and therefore the ſafeſt and ſpeedieſt way to remove a large or painful Scirrhus, is to cut out the indurated Part entirely by the Scalpel, provided one can do it without leaving any Remains, or riſking a fatal Hæmorrhage. What has been ſaid of Scirrhi is alſo true of Strumæ, or ſcrophulous Indurations of the ſalival and lymphatic Glands; which yet I have known well deſtroy'd by Cauſtics in young Patients.

Q. 41. What is the Nature of a *Cancer?*

A. From what was ſaid of a Scirrhus (Q. 37.) it is evident that a great part of it is a dead or foreign Body impervious to the Circulation, though at the ſame time there are many pervious living Veſſels and Nerves interſperſed on the Surface, and through the Subſtance of the Scirrhus; ſo that when theſe living Veſſels and Nerves upon the Surface are inflamed and irritated, ſo as to become painful from any Cauſe, the Scirrhus is then termed a latent or *occult Cancer*; and if this Inflammation continues ſo as to deſtroy the Veſſels, and break through the Integuments, by a ſharp corroding Ichor, it is then termed an open or *ulcerated Cancer.* Hence it is evident, that every thing which irritates a Scirrhus externally, or which increaſes the Circulation too much, whether Plethora, Obſtruction or Acrimony from more remote Cauſes, may turn a Scirrhus into a Cancer.

Q. 42. How do you know an *occult* and an *ulcerated Cancer?*

A. A *latent* Cancer is diſcovered from a Scirrhus preceding, and being followed with a Titillation, Itching, and a ſlight or more intenſe Inflammation and Pain; the Tumor in the mean time enlarging, while the adjacent Blood-veſſels appear more conſpicuous of a livid Colour, and diſtended with Knots or Varices. — But if after theſe Appearances the Skin breaks, and diſcharges a corroding Ichor, I then know it to be an ulcerated Cancer; which is more or leſs malignant, as the Ichor is more corroding, foul and cadaverous; as the Roots ſpread, and the Lips turn back more on all ſides; as the Pain is more burning and intolerable, and the Colour more livid or black. This at length induces occult Cancers in other Parts, fatal Hæmorrhages, Convulſions, Fever, Waſting, Loſs of Smell, *&c.* ending at laſt in Death, of which the Patient is made very deſirous by the direful Symptoms.

Q. 43. How do you treat an *occult Cancer?*

A. Unleſs it can be extirpated by the Knife, or caſt off by a laudable Suppuration, as very rarely happens, a Cancer admits of no Cure but what is palliative. But above all, Care muſt be taken not to render a latent Cancer ulcerated, by the Application of emplaſtic, ſuppurative, acrid or cauſtic Subſtances. Unleſs therefore there is a probability that the Cancer may be removed without a Return of the Diſorder in other Parts, it ought not to be treated either by the Knife or topical Medicines; but I rather endeavour to keep the Diſorder quiet, and to mitigate the Symptoms: namely, by ſaturnine and narcotic Medicines externally, a frequent uſe of lenient Purgatives, with Mercurials, diluent and aperient Medicines internally, avoiding every thing that diſturbs the Sedateneſs and Equability of the Circulation; and by the ſame Means the Symptoms will be alſo mitigated, calling in the Aſſiſtance of Opiates when neceſſary. The ſame Methods are to be uſed alſo to palliate an ulcerated Cancer, when it cannot be extirpated.

Q. 44. What kind of Tumor is a *Bubo?*

A. This is a painful and inflammatory Swelling in the inguinal and ſubaxillary Glands, tending either to a Suppuration or a Scirrhus. Theſe are diſtinguiſhed into *critical*, thoſe which happen after a Fever; *peſtilential*, which happen in the Plague; and *venereal*, ariſing with or without a Gonorrhæa in the venereal Diſeaſe.

Q. 45. How do you treat a *Bubo?*

A. As for critical and peſtilential Buboes, the beſt Method is to promote and bring them to Suppuration as ſoon as poſſible by Cordials internally, with ſuppurating Cataplaſms (*vid.* ℞. Nº 3.), and a Galbanum Plaſter externally: but for venereal Buboes, if they are not too far gone, I attempt to diſperſe them by mercurial Unction, with Bleeding, Purging, and a Decoction of the Woods drank plentifully, keeping the Patient in a cool Regimen: but if the Diſperſion does not ſucceed, I endeavour to promote a Suppuration by high living, dry Frictions upon the Part, a maturating Cataplaſm often applied warm, and a Galbanum Plaſter as before, till the Suppuration is well advanced; and then I make an Opening either by the Scalpel or Cauſtic, eſpecially the latter when there is any remaining Hardneſs, and compleat the Cure by deterging with ſome digeſtive Ointment, mixed with a little Merc. præcip. then incarn and heal as in other Abſceſſes.

Q. 46. How do you diſtinguiſh *incyſted* Tumors?

A. Theſe are Tumors formed by an Obſtruction of the lymphatic and other Arteries in the Glands, and in the adipoſe Membrane; being uſually covered with a pretty thick Coat or Membrane, with which moſt Glands are inveſted, and which is often diſtended to an immenſe Bulk by the included Humours inſpiſſated and reduced to a certain Conſiſtence; from whence the Tumor is denominated either a Scirrhus, when it is very hard; an Atheroma, when the included Matter is like Paſte; a Steatoma, when it reſembles Suet or Lard; a Meliceris, when it reſembles Honey; and a Sarcoma, when it appears fleſhy: though theſe Tumors, as *Celſus* (*Lib.* 7. *cap.* 6.) obſerves, are often found full of Hair. Theſe differ from a Scirrhus, in that the vaſcular Fabric of the Gland (when that forms the incyſted Tumor) is diſſolved by the Humours into a thick inorganiſed Matter or Paſte, confined within the Follicle, (a muſcular and vaſcular Membrane inveſting all compound Glands, to enable them to urge forward their contained Fluids) which becoming thicker and harder forms the Cyſt of the Tumor: whereas in a Scirrhus, properly ſo called, the organic, nervous, and vaſcular Fabric remains undiſſolved, and is therefore capable of Irritation and Pain, ſo as to form a Cancer; but in the incyſted Tumor there is no Senſe at all, except in its Follicle or including Cyſt. The interior Surface of the Cyſt being ſpread with the Mouths of the diſſolved Veſſels, many of which remain pervious, continually ouze a lymphatic Humour into the Cyſt, (when there is a Redundancy of Fluids and a ſtrong *Vis Vitæ*) which thus gradually dilates and thickens, while the Humours are inſpiſſated and digeſted into a Maſs like the reſt: but they do not tend to ſuppurate or form laudable Matter; for that requires a greater degree of Inflammation, and that the Humours be not lymphatic but ſanguineous; and here the aqueous Parts are drunk up by the venal Mouths, as faſt as they are pour'd in by the arterial, the groſſer Parts of the Lymph remaining, and thus the Tumor will enlarge almoſt to any given Size.

Q. 47. How do you treat theſe Tumors?

A. If they can be neither diſperſed nor brought to Suppuration, they muſt be directly extirpated by the Knife; or if the Tumor be ſmall and ſuperficial, the Cauſtic will often ſucceed very well: but when the Tumor is large, a longitudinal Inciſion muſt be made through the including Cyſt, and the

Matter extracted together with the Cyſt; which if it ſhould leave any part behind, muſt be brought away by digeſtive Ointments, with *præcip. rub. &c.* untill the Sinus is reduced to the State of a clean Wound, when it may be incarned and healed.

Q. 48. What is the Nature and Treatment a *Ganglion?*

A. It is an indolent hard Tumor in a Tendon or Ligament, moſt commonly either in the Hands or Feet, ariſing from an Inflammation cauſed by ſome Contuſion or Strain, and is often very difficult to reduce. There are two kinds of this Tumor, one formed of the Synovia, inſpiſſated and hardened within the Capſule of the Tendon, often adhering to both; the other is from a Diſtenſion of the parallel tendinous Fibres, betwixt which the Blood and ſerous Veſſels are diſtributed: if now by any Blow, Stimulus, *&c.* the Artery imports Humours faſter than they can be tranſmitted through and from the Tendon by the Veins, as the Fibres of the Tendon reſiſt, there will be conſequently an Obſtruction in the ſerous Arteries, which are almoſt the only ones in a Tendon; but it is the nature of Serum or Lymph not to ſuppurate, but to harden; and as the Fibres are more removed from each other by the diſtended Arteries, which act with a greater Force upon the Fluid than the Veins; from thence again the Veins will be obſtructed, and the Tumor more increaſed and hardened, as the Veins will return only the more aqueous Parts, while the groſſer are retained. Hence it appears that repeated Frictions, Preſſure, and rubbing with actual Warmth, are the moſt likely Means to aſſiſt the obſtructed Arteries, to ſend forward their ſtagnating Contents, and to promote the Return of the Humours by the Veins; or if theſe do not ſucceed, thoſe of the firſt kind may be removed by Extirpation with the Scalpel, if the Tendon or Ligament itſelf be carefully avoided.

Q. 49. What is the Nature and Treatment of *Paronychiæ*, or *Whitloes?*

A. A *Paronychia* is an exceeding painful Inflammation in the Extremity of the Finger tending to Suppuration, and is diſtinguiſhed into three kinds; the firſt and ſlighteſt whereof is in the common Integuments and adipoſe Membrane round the Nail; the ſecond kind is an Inflammation of the Perioſteum, which inveſts and nouriſhes the Bone and ſoft Root of the Nail itſelf, being much more painful than the former, and not ſo readily coming to Suppuration; often attended with a violent Fever and other bad Symptoms, though the Pain and Tumor are confined to the Finger. The third and worſt Species of the *Paronychia* is ſeated in the Tendons, or their nervous Involucra, inſerted into the Bones of the laſt Joints of the Fingers; for it is remarkable, that the Tendons which bend the two laſt Internodes of the Fingers, are covered by ſtrong ligamentary Sheaths almoſt as hard as a Cartilage; ſo that if an Inflammation be formed either in the ligamentary Sheath itſelf, in the cellular Membrane, Perioſteum, or flexor Tendons, the inflamed Veſſels having no room to dilate from this particular Fabric, the Pain and Inflammation will from that Stricture be infinitely increaſed, and the Pain ſo excruciating as often to cauſe the moſt intenſe Fever, Reſtleſneſs, Convulſions, Delirium, *&c.* and tho' a little Tumor appears in the Finger, yet the whole Hand and Arm become very much ſwelled, and full of Pain. From both theſe laſt Species of the *Paronychia*, if neglected, and the Patient eſcapes with Life, there may follow a loſs of the Bones corrupted with a Caries. The Cure is to be conducted according to the ſeveral Species of the Diſorder; but generally in all the Species it is adviſable not to wait for a Suppuration, but to lay open the inflamed Parts by Inciſion, to remove their Stricture, and diſcharge the confined Matter, if there is any, before it has affected the Bone or adjacent Parts. In the two firſt Species the Inciſion may be made longitudinally on each ſide the Nail, and through the Nail itſelf to the Bone, when the Perioſteum is inflamed; but in the laſt and worſt Species, the Inciſion muſt be made through the Integuments on each ſide of the Finger with a Lancet, ſo as to divide the ligamentary Capſules or Sheaths, confining the Tendons cloſe to the Bones, without injuring the Tendons themſelves, as may be eaſily done by one verſed in the Structure of theſe Parts. The ſooner this Inciſion is made the better, and afterwards may be applied a Fomentation of *aq. calc. & S. V. Camph.* the Patient may be bled in the other Arm, a cooling Purge may be given, *&c.* as in other Inflammations (*Q.* 17.); afterwards the Wound may be dreſſed with Tincture of Amber, Balſ. Peruv. *&c.* and if the Bone is foul, the Wound muſt be kept open, either till the diſeaſed

Part exfoliates, or till the whole Bone comes away. The Dreſſings are compleated with dry Lint, retained by a Dyachylum Plaſter and Compreſs cut in the form of a *Malta* Croſs, ſecured by a Fillet of about a foot long and a finger's breadth, applied ſpirally round the Finger. If the Pain and Tumor do not go off after making Inciſion through the ligamentary Capſule of the Tendon, it is a Sign that the Inflammation extends farther, and that the Capſule of the ſecond Internode muſt be likewiſe divided; and even ſometimes it is neceſſary to continue the Inciſion into the Hand itſelf, or even to the annular Ligament of the Carpus.

Q. 50. What is the Nature and Method of curing *Wens?*

A. Theſe are ſoft fleſhy Tumors, or rather Productions of the true Skin and cellular Membrane, the Blood-veſſels of which are often wonderfully enlarged, ſo as to produce theſe Tumors of various Forms in different Parts of the Body. They may be removed by Ligature ſometimes, provided the Stricture is not too great, for that I have ſometimes known to bring on a Fever and Convulſions; and when the Baſis or Neck of the Tumor is ſufficiently contracted towards the Skin by Ligature, it may be taken off by the Scalpel, taking care to tie up the larger Blood-veſſels. But this is an Operation not adviſable, when the Patient is of a bad Habit, or when there are Glands near the Tumor, as it then often turns out cancerous and incurable.

Q. 51. What is the Nature and Method of curing *Warts?*

A. Theſe are Excreſcences of the Veſſels of the true Skin, joined together with the Cuticle; the former, not being reſtrained by the latter, are extended for want of a due Reſiſtance, ſo as to form an Excreſcence, which may be taken off either by the Scalpel or Cauſtic, or by Ligature with a Thread or Horſe-hair; or after clipping off the top of the Wart with a pair of Sciſſors, the Root may be deſtroyed by a drop of Oil of Vitriol, or Butter of Antimony. But Care muſt be taken to limit the Action of the Cauſtic from ſpreading to the ſound Skin by a defenſative Plaſter with a hole cut in it.

Q. 52. What is the Nature and Treatment of *Corns?*

A. Theſe are a ſort of inverted Warts or Calloſities of the Cuticle and Skin, made by repeated Inflammation, Preſſure or Attrition, which cloſes up the Veſſels, and turns a vaſcular Part into a ſolid; and when theſe extend to the Tendons of the Hands and Feet, they prove extremely painful. Thoſe of the Feet commonly ariſe from wearing too ſmall Shoes, and thoſe in the Hands ſeldom occur but in very laborious People. The only Remedy is by keeping that part of the Skin free from Preſſure, after the Calloſity has been often macerated, pared away, and ſoftened by a conſtant wearing of ſome emollient Plaſter.

Q. 53. What is an *Exoſtoſis?*

A. This is properly a Luxuriency of the Callus in a fractured Bone, or a hard bony Excreſcence anſwering to a Sarcoma in the ſoft Parts: and this ſometimes happens as well without as with a Fracture, when the nutritious Veſſels of the Bone being dilated, cauſe an Enlargement either of its whole Subſtance, or of ſome part, by diſtending the Lamellæ, betwixt which thoſe Veſſels are diſtributed. And although theſe Exoſtoſes or Nodes moſt frequently ariſe in the venereal

real Diſeaſe; yet they alſo ſometimes proceed from external Injuries, as a Contuſion upon the Shin or Spine of the Tibia. Theſe Tumors are hardly to be removed but by cutting off the Excreſcence equal with the Surface of the Bone, then waiting or procuring an Exfoliation and Renewal of the Perioſteum, as in other expoſed Bones.

Q. 54. What is the Nature of a *Spina ventoſa?*

A. This is a Caries and Enlargement of the Bone from an internal Cauſe, namely, an Inflammation in the internal Perioſteum and Medulla, ending in a Suppuration. Thus the Humours and medullary Oil becoming putrid, do by their Acrimony diſſolve the nutritious Veſſels and gelatinous Subſtance of the bony Fibres, leaving their earthy or chalky Part friable like a Calx. This then is an Abſceſs of the Bone, proving the moſt miſchievous when ſeated in the ſpongy Heads and Proceſſes; and frequently ariſes from a Contuſion of the Medulla by ſome Blow or Violence, eſpecially in the Tibia, which lies much unguarded. This is diſcovered from an Inflammation having preceded in the Bone; from an Enlargement of the Bone itſelf, with a throba throbbing Pain, and often a Diſcolouration of the ſuperincumbent Parts. The white Swelling, in the worſt degree, is a *Spina ventoſa*; only ariſing from an Eroſion of the Heads of the Bones in the Joint externally by the acrid Lymph, Synovia, or confined Matter in the Cavity of the Joint and cellular Membrane.

Q. 55. How do you treat a *Spina ventoſa?*

A. The only Means of relieving the *Spina ventoſa*, is to make an Opening the neareſt and ſafeſt way through the ſoft Parts into the Bone itſelf, which may be perforated either by the Trepan or Chiſſel, as ſhall appear moſt convenient, in order to diſcharge the corroding Sanies, which may be waſhed out by ſuitable Injections into the Cavity of the Bone, while the Patient is kept upon an aceſcent and milk Diet, and treated with internal Medicines which reſiſt Putrefaction; and unleſs this can be done, nothing remains capable of ſaving the Patient except an Amputation; nor even will that ſuffice, if the Diſorder, proceeding from a venereal, ſcorbutic or rickety Diſpoſition, breaks out again in other Bones.

Q. 56. What are *Tophes*, *Nodes*, and *Gummata* of the Bones?

A. Theſe are Tumors or Excreſcences, of the Subſtance of the Bone itſelf, differing only in degree of Hardneſs: thus a Node is little inferior in Hardneſs to the Bone itſelf; a Tophe is ſtill ſofter like Horn; and a Gumma is even ſuſceptible of the Impreſſion of the Finger, like the ſoft Gums. In theſe Caſes there ſeems to be a Deficiency of the cretaceous Earth, with which the Bones ought to be ſupplied, to give them a due Firmneſs; and of this we have frequent Inſtances in venereal, ſcorbutic and rickety Patients, in which the Bones have degenerated into a ſoft and even fleſhy Nature, which is then termed *Oſteoſarcoſis*.

Q. 57. What is the Nature and Treatment of a *Furuncle* or Boil?

A. This is a very painful and inflammatory Tumor of the Skin and cellular Membrane, tending to Suppuration, and proceeding moſtly from an uncommon Acrimony of the Humours. If they will not diſperſe by the uſe of *ſp. nitri dulcis ſalis D. &c.* which are particularly uſeful here, they muſt be brought to Suppuration by a Galbanum Plaſter, or

Diachylon *cum Gummis*, emollient Cataplaſms, *&c.* but thoſe in Children are often very ſtubborn and troubleſome, unleſs the acid Acrimony of their Humours is obtunded by Abſorbents, mild Bittters, and ſoapy Mixtures.

Q. 58. What is the Nature and Treatment of the *Scald Head?*

A. This is an ulcerated Cruſt or Scab ſpreading over the Scalp, with an ill Smell, violent Itching, and ſometimes Inequalities like a Honey-comb, breaking out moſtly in Children from feeding upon too groſs Aliments, and eſpecially from a predominating Acid in the Blood; but there is often a venereal Scabies reſembling this in the Head and Face of Adults. The chief Remedy in this Caſe is the *Æthiops aq. benedict. elect. cinnab. &c.* while externally is applied a Pitch Plaſter, which takes off the Hair by the roots, and which muſt neceſſarily be removed in order to a Cure; and when by the uſe of the Pitch Plaſter, the ulcerated Scab appears clean and free from Hair, it may be anointed with *ol. ceræ*, and at laſt healed with *Fryer*'s Balſam and dry Lint.

Q. 59. What is the Nature of a *Gangrene?*

A. This is an incipient Mortification in a fleſhy Part, proceeding from the Circulation ſuppreſſed either by external or internal Cauſes; ſuch as extreme Cold, Weakneſs of the Circulation, a Want of nervous Fluid, the Diviſion of a Nerve or Artery, a violent Inflammation, which can neither be diſperſed, nor brought to Suppuration, *&c.* and therefore a ſtrict Regard muſt be had to which of theſe Cauſes are productive of the Gangrene, which uſually begins in the Panniculus adipoſus, or Integuments; and ſpreading by degrees forms a perfect Sphacelus, when it is extended to the Bone.

Q. 60. What are the Signs of a preſent *Gangrene?*

A. Theſe are taken (1.) from conſidering the preceding Cauſes (Q. 59.); (2.) from the Inflammation and Pain ſuddenly diſappearing, and being followed with a dull Senſibility in the Part, while the Integuments turn pale, blue, livid, or inclined to black; (3.) from a Softneſs or Flaccidity and Pitting of the Skin, which has Veſications filled with a yellowiſh or reddiſh ſerous Ichor.

Q. 61. How do you treat a *Gangrene?*

A. In order to prevent it from turning to a Sphacelus or compleat Mortification, a regard muſt be had to the immediate Cauſe in the Patient's Habit (*Q.* 59.); the Circulation is to be kept up by Cordials and proper Diet; the putrid Humours are to be prevented from returning into the Blood, by diſcharging them externally, by Scarification, Cupping, Leaches, and warm antiſeptic Fomentations or Cataplaſms; by procuring a Separation of the dead from the living Parts by the Application of a continual Warmth, either by Tiles or Sand heated and wrapped up in Cloths; while in the mean time aromatic and ſpirituous Subſtances are not neglected, after the dead Parts have been ſcarified down to the living, fomenting next with Salt, Vinegar, Wine or Brandy, and Spices, which have a Power to reſtrain the Veſſels and Humours from Corruption. In the mean time a free Circulation muſt be reſtored as much as poſſible by diluting internally, with the uſe of Cordials, external Warmth, and moderate Friction; and if by theſe means the Parts cannot be reſtored to their due Circulation, we muſt endeavour to ſeparate the dead from the living, by promoting a Suppuration in the manner before-mentioned, namely, by ſcarifying the dead down to the living Parts, with Cupping, Leaches, *&c.* as before, and a prudent uſe of the Bark internally; while externally Cataplaſms are kept conſtantly warm upon the Part, until the Signs of a Suppuration follow, by which the living Parts recede from the dead. — But if the Gangrene proceeds from Cold, it will be proper to apply Snow, *&c.* as we have obſerved in the Treatment of *Chilblains* (Q. 77.)

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Q. 62. What is a *Sphacelus?*

A. This a compleat Mortification extended even to the Bone, (ſo that a Knife may be run through the Part without cauſing Pain) ſpreading by degrees further into the living Parts, and yielding an intolerable cadaverous Smell.

Q. 63. How do you treat a *Sphacelus?*

A. As there is here an Impoſſibility of reſtoring the diſeaſed Parts to their Vitality, we muſt procure a Separation of the dead from the living Parts either by Nature or Art: that is, by exciting a Suppuration betwixt the dead and the living Parts with warm Cataplaſms applied externally, and by the Bark given internally; of which ʒj or ʒjſs in Powder may be taken every four hours, or rather ʒſs of the Extract, which has produced ſurpriſing Effects in preſerving the living Veſſels ſound, and preventing the ſpreading Sphacelus, as well as in ſuppreſſing the Fever and its moſt urgent Symptoms. But if it is neceſſary to reſtrain the Bounds of the Mortification immediately from extending farther, that may be done by circumſcribing with a Pencil-Bruſh dipped in a Solution of *argent. viv. p.* 1. in *aqua fortis*, *p.* 2. or in *butter of antimony*; each of which may be diluted with *ſp. vini*, if judged neceſſary, being cautious at the ſame time to avoid touching the Nerves, Tendons, *&c.* Theſe Methods are alſo neceſſary to be uſed, if the Mortification ſpreads after an Amputation has been made of the dead Part.

Q. 64. What is an *Ulcer*, and how is it cauſed?

A. An Ulcer is an old cavernous Wound or Solution of Continuity in a ſoft Part, ariſing moſtly from ſome internal Cauſe, uſually an Abſceſs; and being ſubject to a conſiderable Diſcharge of Humours is often very difficult to cure, more or leſs according to the nature of the Part, as the Caſe is more or leſs inveterate, and as the Patient is of a good or bad Habit. If the Ulcer be inveterate, ſinuous and callous, it is called a Fiſtula; or even if it be recent and without Calloſity, but ſeated in the Anus, it is uſually ſo denominated. As a Suppuration or Abſceſs is preceded by an Inflammation, ſo an Ulcer is generally produced by the breaking of an Abſceſs; and when this happens within the Bones, it is termed a *Spina ventoſa:* ſo that any thing which produces a Corruption of the Humours and Veſſels may cauſe an Ulcer; ſuch as Inflammations, Wounds, Contuſions, Fractures, Luxations, Scirrhus, Cancer, *&c.*

Q. 65. How do you treat an *Ulcer?*

A. A ſimple Ulcer, that is, one neither venereal, ſcorbutic, cancerous or callous, requires only to be deterged, or brought to the State of a clean Wound, and then to be incarned and cicatrized as ſuch. In order to the firſt, the Ulcer muſt be laid open as much as poſſible, that its whole Surface may be deterged or cleanſed by the immediate Application of Digeſtives, ſuch as *tinct. myrrhæ & aloes, baſilic. flav. cum merc. præcip. &c.* and then during the Incarnation, the

Dreſſing may be made only with dry Lint, if it affords a laudable Matter, otherwiſe the Lint may be ſpread with ſome vulnerary Balſam, carefully avoiding the uſe of Tents and liquid Injections, as they induce a Calloſity, and macerate and deſtroy the ſprouting Granulations of the good Fleſh; but if the Ulcer be deep, its Mouth muſt be kept open by filling it full of Lint, to give an opportunity of dreſſing down to the bottom, and to prevent the Lips from cloſing too ſoon. When the Cavity is incarned, I cicatrize with dry Lint, or with *Fryer*'s Balſam and a moderate Compreſſure, taking down any Inequalities or proud Fleſh by touching them with *vitriolum cæruleum*, *præcip. rub. alum. uſt. pulv. myrrhæ*, *&c.* to bring it to a level, as the Cuticle advances round the Margin.

Q. 66. How do you treat a *fiſtulous Ulcer?*

A. As in this Caſe there is always a conſiderable Cavity, and uſually a Calloſity, it will be impoſſible to make a Cure until the callous Parts are removed either by the Knife, or the uſe of Eſcharotics; in order to which, the fiſtulous Ulcer muſt be laid open as much as poſſible by Inciſion, or by dilating its Orifice with a Sponge-Tent, if the Patient will not admit of the Knife. If the Fiſtula penetrates in ſuch a manner, that Dreſſings cannot be conveyed to its Fundus, it may be proper to inject a mixture *ex terebinth. vitel. ov. ung. Ægypt. tinct. myrræ* $\overline{aa}$ well incorporated; and when the Fundus has been deterged by this Injection repeated, the Parts are to be brought together and united by Compreſſure and Bandage gradually made from the bottom upwards; but it is always more adviſable, if poſſible, to lay open the Fiſtula to the bottom by the Knife, by which a certain Cure may be made without danger of the Diſorder breaking out again.

Q. 67. How do you treat *cancerous* and *venereal Ulcers?*

A. Theſe generally require the uſe of Mercurials both as well internally as externally; for here Digeſtives are miſchievous, and their place muſt be ſupplied by the *aq. phagedenica*, a Solution of Sublimate in *S. V.* Fumigation with Cinnabar; raiſing a gentle ſpitting occaſionally at the ſame time by Internals, and keeping it under by lenient Cathartics; all which is more eſpecially neceſſary in venereal Ulcers. In the mean time the Patient muſt avoid every thing which heats the Blood, drinking plentifully of a Decoction of the Woods; and the Ulcer itſelf muſt be fumigated, or dreſſed with the mercurial Liquors before directed.

Q. 68. How do you treat an *Ulcer* with a Caries of the Bone?

A. If the Bone appears foul, which I diſcover by its Sponginefs and Inequality to the Finger or Probe, and its dark or blackiſh Colour, the Perioſteum being here deſtroyed, I immediately enlarge the Opening as far as is convenient, and then endeavour to procure an Exfoliation, either by applying a Pencil-Bruſh dipped in a Solution of Mercury in aq. fort.; or rather I perforate the diſeaſed Lamella of the Bone with a Terebra like a triangular Needle, with many ſmall Apertures, and then dreſs with dry Lint, or ſome Balſam; by theſe means the repullulating Veſſels of the ſound Lamella will grow up through the Foramina, throw off the dead Scale, and renew the Perioſteum, haſtening the Cure much more than the Raſpatory or the Cautery; if the Caries penetrates into the Medulla, the Bone muſt be perforated with the Trepan, as in a Spina ventoſa of the Tibia (*Q.* 55.) Hence it is evident, that the Cure of a

Caries conſiſts chiefly in removing the foul part of the Bone, that the Perioſteum may be renewed over the ſound Lamella. If the Caries is in the ſpongy Heads of the Bones in a Joint, the only Remedy is to amputate; or if it happens in a ſmall Bone, as of the Carpus, Tarſus, *&c.* it muſt be entirely taken out, unleſs the diſeaſed part of the Bone ſeparates from the ſound, as ſometimes happens even in the larger Bones.

Q. 69. What is an *Emphyſema?*

A. This is a Tumor from elaſtic Air collected in the cellular Membrane, which is ſometimes inflated, after the manner uſed by Butchers to make their Meat appear fat: thus when the Integuments of the Skull have been wounded, the Air contained betwixt the Plaſter has inſinuated itſelf into this Membrane, and ſpread itſelf all over the Face and Eyes, ſo as greatly to disfigure the Patient, and prevent the Eye-lids from opening: but above all, theſe Tumors happen moſt frequently in Wounds penetrating the Thorax, when the Air confined in that Cavity is forced into the cellular Membrane next the Pleura and intercoſtal Muſcles. In this Caſe the contained Air is to be brought to the

Opening by Preſſure with the Hands, and by the Application of ſuitable Compreſſes and Bandages; or an Inciſion muſt be made through the Integuments in the moſt commodious Part, to make a way for the Air to be preſſed out. Thus impoſing Beggars ſometimes make a ſmall Puncture through the Skin of the Forehead in ſome Infant with a Penknife, and by inſerting a ſmall Quill, they inflate the ſubcutaneous cellular Membrane ſo as to make the Child a very moving Object, and incapable of being known by its neareſt Friends.

Q. 70. What Obſervations have you made with reſpect to *Mortifications?*

A. That a particular Regard muſt be had to the Cauſes, in order to point out the Method of Cure: as if it proceeds from Inflammation, often accompanied with black or thick Urine, the antiphlogiſtic Method of Cure muſt be followed by Bleeding and cooling Medicines, *&c.* But if a Gangrene ariſes from Weakneſs, or a languid Circulation, the Bark and other cordial Medicines are found of the greateſt Benefit.

Q. 71. What have you obſerved with reſpect to *Ulcers?*

A. That in Women they receive an Alteration in their Appearance and the Diſcharge of their Matter every Month, when the Menſes are ſuppreſſed; and that in ſuch, as alſo in dropſical Habits, they are extremely difficult to cure, even though aſſiſted by proper Evacutions and alterative Medicines.—That Ulcers which have been ſubject to a profuſe Diſcharge for any time, ought never to be healed up without ſubſtituting Iſſues and other Evacuations, repeated at convenient Intervals, to draw off the redundant Humours, and prevent them from ſettling upon the Lungs, *&c.*—That in putrid Ulcers, as well as in Mortifications, where there is a Return of foul Matter into the Blood, Acids are of the greateſt ſervice to correct the State of the Humours.—That when a conſiderable Pulſation and Redneſs appears in an old Wound or Ulcer, it often preſages a conſequent Hæmorrhage, eſpecially in Women a little before the approach of their Menſes.

Q. 72. What is the Nature of a *Burn* or *Scald?*

A. It is an Inflammation differing in degrees, according to the Intenſity of the Fire or Heat applied, by which the Veſſels are contracted, ſhrunk up and deſtroyed, the Humours coagulated, obſtructed, or extravaſated: ſo that the Effects of burning in different degrees reſemble thoſe of a Phlegmon, from the ſlighteſt Inflammation, till it degenerates into the worſt Sphacelus. Burns or Scalds therefore vary according to the Intenſity or Duration of the burning Cauſe, and the particular Nature of the affected Part. Thus boiling Spirit of Wine ſcalds much leſs than Water, Water much leſs than Oil, Oil than melted Lead or other Metals, *&c.* and each of theſe burn more or leſs in proportion, as they are ſuffered to continue a longer or ſhorter time upon the Part. But which ever be the Cauſe, the Action is the ſame, namely, a Deſtruction of the Veſſels and circulating Humours tending to a Gangrene; yet ſo that there may be as many degrees between the ſmalleſt and greateſt Burns, as betwixt the ſlighteſt Eryſipelas and the moſt perfect Sphacelus.

Q. 73. How many Degrees of burning do you make, and how do you diſtinguiſh them?

A. They may be properly diſtinguiſhed into four Claſſes; the firſt and ſlighteſt of which is, when the Veſſels are ſo far injured, as to cauſe an Inflammation and Redneſs without a bliſtering of the Part. The ſecond is when the Cuticle is raiſed into a Bliſter, attended with great Pain; and theſe two agree with a reſolvable Inflammation. The third Degree is when the Integuments or Fleſh are ſo burnt as to form a Cruſt or Eſchar, which muſt, as in a Gangrene, be caſt off by Suppuration. The fourth and laſt Degree is when the fleſhy Parts are burnt and deſtroyed to the Bone, ſo as entirely to deprive them of the vital Circulation; and this agrees with a compleat Sphacelus.

Q. 74. How do you treat *Burns* and *Scalds?*

A. As theſe agree in their Nature with the different degrees of Inflammation, ſo they come under the antiphlogiſtic Method of Cure; Bleeding, cooling Purges, plentiful drinking of thin Liquors, with the application of topical and diſcutient Remedies, are therefore required when the Burn or Scald comes within the Limits of a reſolvable Inflammation. Hence the immediate Application of every thing which preſerves the Veſſels firm and able to ſuſtain the Impulſe of the Humours, will be ſerviceable in Burns, as they prevent Extravaſation; thus Ink, Vinegar, Alum diſſolved in Water, Alcohol Vini, *&c.* immediately applied in a ſlight Burn or Scald, will prevent a bliſtering of the Part; and ſuch things as attenuate and diſſolve the Humour, ſo as to make them capable of pervading the ſmall Veſſels, will diſperſe the Inflammation, Pain and Tumor; ſuch are raw Onions, Soap and Oil beat to a Cataplaſm, holding the Part before the Fire, Tincture of Steel in Spirit of Wine, Saccharum Saturni, and other ſaturnine Preparations, are of the greateſt uſe in theſe Caſes.

Q. 75. How do you treat a Burn of the ſecond Degree, with a Veſication of the Skin?

A. In this Caſe it is moſt adviſable not to open the Bliſter, unleſs it be extremely large, becauſe the Lymph will be abſorbed, and the Cuticle makes the beſt and moſt natural Defence to the Skin, whence it ought to be preſerved. In this Caſe therefore the Patient is bled, and treated as in other Inflammations, while cooling internal Medicines are uſed with emollient and ſaturnine Topicals, or thoſe before directed for Burns of the firſt Degree (Q. 74.)

Q. 76. How do you treat a Burn, which is ſo great as to tend to a Gangrene?

A. As in this Caſe one cannot hope to reſtore the Parts to their natural State by diſperſing the Diſorder, my Intention therefore is here, as in other Inflammations of the ſame Degree, to promote a Suppuration, in order to ſeparate the Parts, which have been ſo altered by the Fire, that they are dead, and deprived of the Circulation. The Eſchar is therefore to be treated with Emollients and warm Cataplaſms, till it is caſt off; and when the Burn is brought to the State of a clean Wound by the uſe of Digeſtives, I then incarn, and cicatize as in other Wounds. But for burning in the fourth Degree (Q. 73.), nothing but an Amputation can ſucceed, ſince it is to be conſidered as a perfect Sphacelus.

Q. 77. What is the Nature and Treatment of Inflammations and Tumors ariſing from Cold, called *Chilblains, &c.?*

A. Theſe are the ſame with Burns, though proceeding from an oppoſite Cauſe, namely, an Inflammation with Heat, Tumor, Redneſs and Pain, from an Obſtruction of the Veſſels too much contracted, and an Inſpiſſation of the Humours congealed and rendered impervious by the Cold. Theſe may be therefore commodiouſly diſtinguiſhed into the ſame Degrees with Burns; but their Treatment muſt be very different from thoſe of other Inflammations, ſince the Application of things actually warm proves of the worſt Conſequence, by cauſing an Ulceration, Gangrene or Sphacelus. In the firſt Degree therefore of this Diſorder, while the Skin continues whole, only diſtended, with a troubleſome Inflammation and Itching, it is moſt adviſable to rub the Part with Snow or cold Water, and to avoid bringing them to the fire as much as poſſible; and afterwards may be applied *ſp. vini camph. cum theriaca ol. petræ, balſ. ſulph. &c.* then the Patient may be put to bed, and ſweated gently by internal warm Medicines. In the ſecond Degree tending to Suppuration, *ol. ceræ balſ. Peruv. tinct. aloes, myrrhæ, &c.* will be proper to deterge and heal with, applying a Compreſs dipped in *aq. calcis cum ſp. vini camph.* But when a Gangrene or Sphacelus takes place, a Separation muſt be procured, or an Amputation made, as was before obſerved in ſpeaking of a Gangrene.

Q. 78. Why is a Scar unavoidable in great *Burns?*

A. A Scar, as we obſerved before, is an inſenſible, imperſpirable and callous Subſtance, ſupplying the place of the Cuticle; but the Cuticle cannot be regenerated in great Burns, becauſe the reticular Body of *Malpighi* is deſtroyed, from whence the Cuticle immediately ariſes: but if the mucous Body of *Malpighi* remains entire, while the Cuticle is ſeparated from it into a Bliſter, ſuch a Burn may be eaſily cured without a Scar. But when a Bliſter-Plaſter, Puſtules of the Small-Pox, *&c.* do not only deſtroy the Cuticle, but likewiſe the ſoft mucous Body expanded under it, together with the nervous Papillæ of the Skin, a Cicatrix is unavoidable, and the Skin is in that Part leſs ſenſible and perſpirable.

Q. 79. What is a *Contuſion?*

A. A Contuſion properly is an Aſſemblage of ſmall Wounds or Ruptures of the Veſſels made by ſome obtuſe Inſtrument, while the outer Integuments remain whole: otherwiſe, if the Integuments are divided, it is rather a contuſed Wound. It is alſo termed an Ecchymoſis or Extravaſation of the Humours into the cellular Membrane and adjacent Parts.

Q. 80. What are the Conſequences of a *Contuſion?*

A. Theſe vary according to the degree of Injury, and nature of the Part injured. If it be ſlight or ſuperficial, an Ecchymoſis or black and blue Spot follows from the Blood extravaſated, which is often diſſolved into Lymph, and diſperſed in time without further Injury. If an Artery be contuſed, a true or ſpurious Aneuriſm may follow, Varices and Hydatides in the Veins, Ganglions in the Nerves and Tendons, whence a Palſy, Gangrene, or withering in the Muſcles, a Scirrhus or Cancer in the Glands, an Abſceſs or Gangrene in fleſhy Parts, and in the Viſcera; or even ſudden Death, when it proceeds from a Concuſſion of the Brain, as alſo from a Blow on the Stomach, Diaphragm, *&c.* in the Bones a Caries, a Laceration and Corruption of their Medulla and ſpongy Heads, *&c.* From which Conſiderations one may foreſee the Danger and Events of Contuſions.

Q. 81. How do you treat a *Contuſion?*

A. I firſt endeavour to diſperſe the extravaſated or diſplaced Humours to prevent a Suppuration; and if this is not practicable, I endeavour to promote a Suppuration, and prevent a Gangrene. The firſt I endeavour to procure by relaxing the Veſſels, in general by repeated Bleeding, with cooling Purges; and in the Part itſelf, by the uſe of diſcutient antiſeptic Fomentations and gentle Frictions, with plentifully diluting internally at the ſame time with Decoctions or Infuſions of the opening Roots, with Nitre, Honey, ſaline Draughts, *ſp. nitri*, mild Acids, *&c.* which reſiſt Putrefaction, attenuate and preſerve the Humours in their ſound State. And theſe Methods I proſecute more vigorouſly, as the Contuſion is more violent, and in a Part of the greateſt Conſequence.

Q. 82. How are the extravaſated Juices diſperſed by theſe means?

A. It is the nature of the red and yellow ſerous Globules of the Blood to diſſolve into ſmaller lymphatic ones, thirty-ſix times leſs than the red ones, barely by reſt, provided their globular Fabric can be preſerved from Putrefaction; ſo that the red and yellow

Parts of the Blood, which were in this Diſorder forced either out of the Veſſels into the cellular Membrane, or into the lymphatic Veſſels (where ſtagnating they diſcolour the Part) diſſolving by degrees, they become ſmall enough to paſs through their including Veſſels into the common Circulation; ſo that a ſlight Contuſion will in this manner of itſelf gradually diſperſe in time, as the Colour of the Part changes from a red to a black or livid, thence to a yellow more or leſs deep, in proportion as the Diſſolution or Return of the red Globules takes place.

Q. 83. What topical Applications do you make uſe of, to prevent Suppuration in *Contuſions?*

A. Such as preſerve the ſolid Fibres and Veſſels from Diſſolution, by rendering them more compact, and able to ſuſtain the Impulſe of the Humours, till the latter are attenuated; ſuch as *ſp. vini camph. aq. calcis acet. litharg. ung. opodeld. vin. calid. cum ſal. ammon. crud. &c.* Theſe will be greatly promoted by gentle Frictions aſſiſted with Compreſſure, provided the Inflammation be not violent.

Q. 84. How do you proceed, if this Method does not diſperſe the *Contuſion?*

A. If the Part be ſuperficial, and a Suppuration is already begun, I endeavour to forward it by the repeated application of emollient Cataplaſms, *ex rad. lil. alb. ceparum, ficibus, lini ſem. micis panis in lacte coctis, &c.* mixed with a little of the warm Gums, and ſome Oil or freſh Butter, and kept conſtantly warm upon the Part, till the Tumor forms a white Point, in which I make an Inciſion to diſcharge the Matter, deterge and heal as in other clean Wounds.

Q. 85. What is a *Wound?*

A. It is a recent and bleeding Diviſion of the Continuity in any ſoft Part, by ſome hard and ſharp Inſtrument. If this happens in a ſingle Point only, it is called a Puncture when ſmall, otherwiſe a Stab when large: and if the Diviſion is made in a hard Part, it is called a Fracture, when from an obtuſe Inſtrument; but when the Diviſion either of Bone or Cartilage is made by a ſharp-edged Inſtrument, it is commonly termed a Wound of them. Otherwiſe a Wound may be defined more generally any recent Solution of Continuity in a vaſcular Part, whether from an external or internal Cauſe; and in this Senſe Contuſions and internal Hæmorrhages come under the Definition of Wounds.

Q. 86. How many Kinds of Wounds do you make in general?

A. They are primarily four; (1.) *Compleat*, where the Skin or common Integuments are divided. (2.) Incompleat, commonly termed an Ecchymoſis, in which Veſſels are divided, while the Integuments remain entire: and (3.) the Compleat are again either *Simple*, unattended with any violent Symptom; or (4.) *Complicated*, when accompanied with a Fracture, Contuſion, Laceration, Poiſon, *&c.* — Wounds are again diſtinguiſhed from the Part in which they are ſeated, as of the Integuments, Arteries, Lymphatics, Muſcles, Tendons, Nerves and Viſcera; of the Head, Neck, Thorax and Abdomen. Hence they are again diſtinguiſhed into Curable, Doubtful, and Incurable, according to the Nature and Importance of each Part or Viſcus, with the Circumſtances of the Wound, *&c.*

Q. 87. What are the Signs and Stages of a compleat ſimple Wound?

A. As theſe are always ſuperficial, penetrating no deeper than the common Integuments and muſcular Fleſh, the Symptoms which attend them while recent, in a good Habit, are (1.) a ſlight Hæmorrhage, which ceaſes as ſoon as the Veſſels, by their contractile Nature, have their Orifices compreſſed, either naturally by ſhrinking into the divided Parts, and being ſecluded by the congealed Blood; or artificially, by Compreſſure, Ligature, Styptic, *&c.* (2.) As the Veſſels gradually contract, the Diſcharge becomes by degrees leſs bloody and more ſerous; the divided Lips turn back, and become ſlightly inflamed uſually in about twenty-four hours after its Infliction. (3.) This ſerous Diſcharge in a day or two after becomes more incraſſated, but ſtill ſerous, acrid, and often fœtid; and this continues uſually two or three days, under the denomination of Ichor; and at the ſame time, if the Wound be of any conſiderable extent, a ſlight Fever attends. (4.) The Diſcharge now (about the third or fourth day) becomes leſs, appears thick, tenacious, uniform, and like Cream, under the Denomination of Pus or Matter; and while this Appearance continues, the Cavity of the Wound fills up with little Granulations of the ſprouting fleſhy Fibres like Snails Horns, which proceed from the Circumference towards the Center, till the whole is incarned or filled up.—Thus the Progreſs of a Wound is diſtinguiſhed into four Stages. So long as the Hæmorrhage or ichorous Diſcharge continues, the Wound is ſaid to be *crude*; when an uniform laudable Matter appears, and takes off all the dead Extremities of the Fibres and Veſſels which have been corrupted by the Air, it is ſaid to be in a State of *Digeſtion*; and when the Surface of the Wound appears of a clean red without Inflammation, and its Cavity begins to diminiſh by the ſprouting ends of the Fibres, the Wound is ſaid to be in a State of *Incarnation*; and finally, after the Wound is filled up, the Skin and Cuticle, extending themſelves from the Margin, by degrees ſpread over the whole, when the Wound is ſaid to be in a State of *Cicatrization*, which compleats the Cure. But theſe two laſt, namely, Incarnation and Cicatrization, take place only where there is a loſs of Subſtance.

Q. 88. How do you treat a ſimple recent Wound without loſs of Subſtance?

A. If there are no foreign Bodies to be removed, I have nothing more to do than cloſe the divided Lips, retain them in their natural Situations, and prevent the luxuriant ſprouting of the Fibres into a fungous or proud Fleſh above the ſurface of the Skin, whence the Part might be increaſed beyond its natural Bulk.

Q. 89. How do you accompliſh theſe Intentions?

A. By a judicious and careful replacing of the wounded Lips, agreeable to the natural Uniformity of the Part, by my Fingers; afterwards by retaining them in that Poſture, by one kind or other, either of the true or of the dry Suture, aſſiſted with ſuitable Compreſs and Bandage, dreſſing only with dry Lint, or ſome mild Balſam ſpread on Lint, to exclude the Injuries of the Air; taking care at the ſame time either to bleed and cool the Patient, or to warm and invigorate, as they are either robuſt, plethoric, and diſpoſed to Inflammation, or old, weak, and diſpoſed to gangrene; not neglecting a proper Diet and Regimen, if ſuch ſhall be found neceſſary.

Q. 90. How is Digeſtion carried on, and of what uſe is it in a Wound?

A. Laudable Matter is formed of the Chyle and ſerous Juices, extravaſated from the wounded Veſſels, digeſted and changed by the Heat of the Part, and well ſecured from the external Air by ſome Plaſter or other Dreſſings, otherwiſe it would be corrupted by the Air. The uſe of this Matter when laudable, is to deterge and ſeparate the impervious, dead, and lacerated Ends of the Fibres and Veſſels, that they may afterwards unite with each other; and therefore laudable Matter is ſo far from injuring a Wound, that it ſerves both to incarn and conſolidate it; though ſome, from an erroneous Opinion of its being offenſive, are ſo ſcrupulouſly exact in wiping it off, that they thus retard the healing of the Wound, almoſt as faſt as it advances by Nature.

Q. 91. How is Incarnation or Loſs of Subſtance ſupplied in a Wound?

A. This is not the Effect of any ſarcotic Medicine, as was formerly imagined, but is produced merely by a Germination of the ſmalleſt vaſcular Fibres and Veſſels themſelves; for we ſee that the Veſſels not only unite regularly with each other, Arteries with Arteries, Veins with Veins, and Nerves with Nerves, but alſo that their Branches are extended, elongated, and renewed; as when one Branch of a Tree being cut off, another grows out in its place. How Nature performs this, is not eaſy to ſay; but it ſeems to be a juſt Appoſition of the earthy and gelatinous Matter, which compoſe the proper Subſtance of an animal Body: and this being applied ſucceſſively to the ſides and ends of the wounded Veſſels, is by degrees as it were wire-drawed or made hollow as the Veſſel advances, by the Impulſe of the Humour urged on behind by the Force of the Heart and Arteries. Thus may a ſmall Artery be elongated to any degree, till it meets and is reſiſted by ſome other Veſſel; but if that Veſſel which it meets is an Artery, it cannot unite with that, but will turn out of the way, becauſe of their oppoſite Motions and Impulſe of their Humours: but it no ſooner meets with a divided Vein, but they unite together, and the Humour urged on by the Artery, finds a ready Courſe through the Vein. And thus is the Circulation continued by new Veſſels formed in the regenerated Fleſh, which ſupplies the loſt Subſtance,

ſtance; only the Veſſels are fewer in proportion than at firſt. But the Nerves are not ſo perfectly renewed as the Blood-veſſels; and therefore ſuch regenerated Fleſh has ſcarce any ſenſe of feeling.

Q. 92. What Precautions are to be taken to procure a laudable Incarnation?

A. To ſupply the Patient with nutritive and mild Aliments of an eaſy Digeſtion, and to regulate the Circulation of the Blood, ſo as to be neither impetuous nor deficient; for in the firſt Caſe the nutricious Juices will be impelled forward ſo ſwiftly and violently, that the wounded Veſſels will be over diſtended, proud Fleſh will be formed, and the Parts inflamed, or ſuffer a Diſſolution inſtead of a laudable Incarnation: in the laſt Caſe, if the Humours are not impelled with a due force, the Veſſels will not be renewed by them, but the wounded Lips will be pale, flabby, and diſpoſed to Gangrene; and therefore a moderate Redneſs without Inflammation in the Wound, with a moderate quantity of good Matter, are the beſt Signs of a laudable Incarnation. From what has been ſaid, the pernicious Effects of ſtrong Liquors, high ſeaſoned Foods, *&c.* in caſe of Wounds, muſt be ſufficiently apparent.

Q. 93. How do you cicatrize the Wound, and keep it level?

A. After the Wound is filled up, I dreſs only with dry Lint, and uſe a proportionable Compreſſure by Bandage to keep it upon a level; or elſe I apply Lint dipped in *alcohol vini*, ſaturated with *colophonium nigrum* or *Fryer*'s Balſam; obſerving when neceſſary to take down the Margin, next the Skin, by Eſcharotics. But no Method will ſuffice, without a moderate Reſiſtance given by Compreſs and Bandage, which alone with dry Lint will procure a Cicatrix much more uniform and ſightly, than when any Cauſtic, Styptic, or aſtringent Application is uſed. That the Cicatrix begins to form, I know from the ſpreading Whiteneſs and more Compactneſs of the Margin of the Wound advancing towards the Center, while other whitiſh Specks appear ſpreading on the Surface towards the Margin.

Q. 94. What Wounds are to be united by *Suture?*

A. Such only as are recent, free from foreign Bodies, loſs of Subſtance or Inflammation: but in Parts which are very apt to contract, a Suture may be uſeful only to retain them together, and prevent their flying back from each other.

Q. 95. What *Sutures* do you make uſe of in Practice, and how are they performed?

A. Sutures are either true or baſtard; the laſt, made without a Needle and thread, is commonly called dry, as the former is called the bloody Suture: the firſt is made with a Needle and thread, and the dry Suture is made with ſticking Plaſters. The dry Suture, abſurdly ſo called, is only fit for ſuperficial and even Wounds, eſpecially in the Face, Neck, or ſome other Part in ſight; whereas if the Wound be deep, or the Diſtraction of the Parts great, it will be neceſſary to uſe the true Suture with a Needle and thread, aſſiſted with Compreſs and Bandage. The dry Suture then is made with Diachylon or Diapalma Plaſter, mixed with a little Turpentine, ſpread on Leather, and cut in the ſhape which beſt ſuits the Part, uſually in ſlips, placed at a ſmall diſtance from each other, as in *Tab.* C. *Fig.* 1. or, according to *Petite*, with ſmall holes in the middle of them, that the wounded Lips may be ſeen, and treated with proper Remedies. Before the Application of either of theſe Sutures,

tures, (as repreſented in *Tab.* C. *Fig.* 1. *a*, *b*, *c*.) we are to obſerve, 1. that the Hair be ſhaved off; 2. that the Emplaſter be of a due Conſiſtence; the older and thinner ſpread, the better it holds, and eſpecially when ſpread upon coarſe Linen; 3. to make them of a due length, to extend a conſiderable way upon the ſound Skin, in order to hold the more firmly; and to place them ſo, as to give a free diſcharge to the Matter.

Q. 96. How many Kinds of the true Suture do you make?

A. Sutures are from their uſe diſtinguiſh'd into Incarnative, Retentive, and Reſtrictive. Theſe are again diſtinguiſhed into Simple and Compound; under the firſt come the interrupted, the glover's, and the twiſted Suture. The *interrupted Suture* is made by paſſing a ſtrait or crooked Needle, armed with a waxed thread, through the wounded Lips approximated together, obſerving to enter the Needle at a ſufficient breadth from the Wound, that the ſtitches may hold faſt. This being repeated at proper diſtances, the Needle is taken out, and the threads tied together, beginning firſt with the middlemoſt, and ſo proceeding to each end. The threads are firſt tied in a ſimple knnot, and after drawing them together, they are tied again over a Compreſs with a ſlip-knot. The ſtitches may be an inch more or leſs diſtant, according to the nature of the Wound; ſee *Fig.* 4. *Tab.* C. The *quilled Suture* is made by ſewing Quills or pieces of Emplaſter rolled up to the margin of the Wound, as repreſented in *Fig.* 5. *Tab.* C. the loop of the thread being placed round one Quill, the Needle and thread is then conveyed through the Lips of the Wound, and tied upon the other Quill *a*, at *c*. This was much in uſe with the Ancients, but is at preſent rejected. The *twiſted Suture* is ſeldom uſed, but in the Hare-Lip; and it is made by thruſting one or more Needles through the Lips of the Wound, twiſting the thread round each Extremity, as repreſented in *Fig.* 8 and 9. *Tab.* C. The *glover's Suture*, *Fig.* 7. which is commonly uſed for Wounds of the Inteſtines, is made with a fine Needle threaded with ſilk, the ſtitches being made at about a tenth of an inch diſtance from each other, by carrying the thread round in the ſame manner as a Glove is uſually ſewed, and as repreſented at *Fig.* 7. *Tab.* C. But in general it is to be obſerved, that Sutures ſhould never be uſed where Compreſs and Bandage will ſuffice, as in moſt Caſes they generally will, except in angular Wounds, and then the interrupted Suture recommends itſelf, as being made by the feweſt ſtitches. To theſe may be added the Suture of a Tendon; but it is found by Experience of late, that if the Limb is retained in ſuch a Poſture, as to keep the Extremities of the divided Tendon together, they will unite as well or better without than with a Suture, and therefore Compreſs and Bandage are in this Caſe alſo preferable.

Q. 97. What do you underſtand by a *complicated* Wound?

A. One that is either venomous, contuſed, or attended with ſome violent Symptom, or Injury of a large Blood-veſſel, Nerve, Tendon, Bone, *&c.*

Q. 98. Which do you make the leaſt *complicated* Wound?

A. One that is attended only with a loſs of Subſtance in a ſoft, ſuperficial or muſcular Part.

Q. 99. How do you treat ſuch a Wound?

A. In this Caſe it would be in vain to attempt to unite the Lips either by Suture or Deligation, till the loſs of Subſtance is ſupplied; and therefore I am to wait and keep it under the Treatment of a ſimple Wound, till Nature has ſupplied the loſt Subſtance, keeping the Patient in a proper Regimen, and the Surface of the Wound defended from the Air with ſome ſoft vulnerary Balſam applied upon ſoft Lint, very looſely retained, that the Extremities of the Veſſels and Fibres may be kept in a ſoft and yielding State; and being careful not to obſtruct the repullulating Granulations of Fleſh by too ſtrict a Bandage, nor to irritate them by abrading the gelatinous Mucus, which naturally reſtores, and adds to the growing Parts; and therefore it is better to take off the Matter, by abſorbing it with ſcraped Lint, rather than by wiping the Surface. But if any Part of the Wound appears fungous or diſcoloured, that muſt be deterged with the Application of ſome Digeſtive, agreeable in Strength to the Quantity and Hardneſs of the Fungus or diſcoloured Part; ſuch as *pulv. myrrhæ & aloes, vitriolum Rom. vel merc. præcip. rub. per ſe, vel cum ung. digeſt. aqua phagædenica, &c.* In the mean time the Patient muſt keep to a nutritive and eupeptic Diet, avoiding all fermenting Liquors, except in caſe of Weakneſs; Reſt and Sleep are to be indulged, and the latter is to be procured by Anodynes, if wanted; and I obſerve to keep the Bowels open with Laxatives, if they are not ſo naturally.

Q. 100. What are the uſual *Symptoms* which attend a large complicated Wound, and how do you treat them?

A. Theſe are principally Hæmorrhage, Pain, Convulſions, and Fever. The firſt, if moderate, and in a young full Habit, may be allowed, to prevent Inflammation, and worſe Conſequences; but if profuſe, or from a Wound in ſome large Artery, if it be acceſſible, the Hæmorrhage is to be ſuppreſſed, either by totally dividing the Artery, that it may contract and be compreſſed within the ſoft Parts, as in Wounds of the temporal, cubital, and tibial Arteries; or by making a Ligature on the Artery with a crooked Needle and waxed thread, which is the ſureſt and beſt way; but for the preſent it may be ſuppreſſed by the Tourniquet, till the Ligature can be made.

Q. 101. What Method do you take when the wounded Artery is not acceſſible?

A. If the Artery can neither be compreſſed, totally divided, nor contracted, by the Application of Alcohol or other Styptics, as happens in Wounds of the internal Arteries; in that Caſe the Patient ſeldom bleeds longer than to faint away, and then Ligatures are to be applied to the Limbs, to retard the Motion of the Blood; the Patient is to be conveyed to ſome cool and ſtill place, and in that manner to be kept two or three days, carefully avoiding all cordial and ſtimulating Medicines, and ſupplying him only with Whey, very thin Broths, *&c.* for fear of renewing the Hæmorrhage. But in ſuperficial Hæmorrhages, or thoſe which happen in ſome Cavity, as the Socket of a Tooth drawn, or when a Bone is near, *&c.* the ſpace may be filled with dry Lint, or Lint dipped in *alcohol vin.* made hot, or in Water, in which has been diſſolved *Vitriolum Rom.* drying it afterwards; or, in ſome Caſes, by injecting Alcohol, as in caſe of a profuſe Hæmorrhage at the Noſe, from a Rupture of the Arteries, which paſs through the Os cribriforme, with the olfactory Nerves, *&c.* or for the ſame purpoſe may be uſed the *Helvetian* Styptic, which is a Tincture of Steel in *French* Brandy. But Styptics and Cauteries ſhould never be uſed to ſuppreſs an Hæmorrage, when Ligature or Compreſſure can take place.

Q. 102. Which of theſe Ways do you prefer for ſuppreſſing an Hæmorrhage?

A. That by ſuitable Bandage and Compreſſes or Bolſters appears to be the beſt and moſt natural Method, when the Artery runs along the ſide of a Bone. Nor is it neceſſary to compreſs the Artery ſo far, as totally to occlude its Paſſage to the Blood, but only to impede its Efflux, and retain the Thrombus, ſo as to grow to the ſides of the divided arterial Coats. But this requires great Judgment, not to let the Compreſſure be too ſmall, to prevent an Aneuriſm. But if the wounded Artery lies within a Bone, which prevents its lateral Compreſſure, in that Caſe the only Means remaining is to apply dry Lint, and retain it forcibly againſt the divided Orifice.

Q. 103. How do you remove the *Pain* and ſymptomatic *Fever* in Wounds?

A. Pain ſeldom happens to ſo great a degree from the natural Contraction of the divided Parts, as to require a ſeparate Treatment, unleſs the Part be nervous or tendinous,

nous, contuſed, inflamed or irritated by ſome foreign Body; and therefore the firſt Enquiry muſt be, from which of theſe immediate Cauſes the Pain and Fever proceed: the foreign Bodies are to be removed, the Inflammation is to be allayed by bleeding, with cooling, internal and topical Remedies, emollient Cataplaſms, *&c.* But if the Part be either Nerve or Tendon, nervous or tendinous, the Caſe is often dangerous, and *Convulſions* or Death the Conſequence, unleſs the Nerve be totally divided, or the Tendon kept relaxed; which muſt be therefore put in practice to ſave the Patient, if other Methods will not ſuffice; even though this may induce a Palſy or withering of the Part. But firſt it may be proper to try the warm Balſams, and endeavour by ſuitable Dreſſings to take off the Diſtraction as much as poſſible from the Part; which Diſtraction being removed, the Fever, Convulſions and other Symptoms conſequently vaniſh.

Q. 104. But what Method do you take, when *Convulſions* follow from too great a loſs of Blood, inſtead of any of the forementioned Cauſes? (*Q.* 103.)

A. In that Caſe, as the Heart is not duly ſupplied with Blood, and the Arteries do not force it ſufficiently into the Brain and Cerebellum; ſtrait Stockings and reſtrictive Bandages are therefore to be applied to the Limbs, and the Abdomen is to be ſwathed, while in the mean time the Patient is ſupplied with Broths, Whey, *&c.* after being revived by the Application of Volatiles to the Noſe, or Cordials internally, if there is no danger of their renewing the Hæmorrhage.

Q. 105. What are the Conſequences of a large Artery or Nerve being divided?

A. If the firſt does not induce a fatal Hæmorrhage, the Parts below the Wound being no longer ſupplied with Blood, unleſs they are furniſhed by other Arteries, muſt conſequently either mortify, or wither and dry up; and if partially divided, it cauſes an inceſſant Hæmorrhage, or an Aneuriſm. But if a large Nerve be totally divided, it at firſt brings on excrutiating Pain and Inflammation, by its contracting and ſtretching the other Branches communicating therewith; and afterwards the Part becomes paralytic, and either withers, or elſe is conſumed by a Mortification; for the Arteries being no longer able to propel, or circulate their contained Humours for want of the Nerves which ſupply their Coats, the Humours are accumulated, ſtagnate, corrupt, and mortify the Part. —But if the Nerve, or even a Tendon be only half divided, there follows a continual and ſlow Laceration, a ſpreading Inflammation, excrutiating Pain, Fever, Delirium, Convulſions, *&c.* with a Gleet, or thick ſerous Diſcharge; which Symptoms are in proportion more violent, as the Nerve is more diſtracted or ſtretched; and therefore here, as in the Artery, a total diviſion of the Nerve or Tendon, or an Amputation, muſt often be made to ſave the Patient; though we may firſt try the Application of a little Balſamum Peruvianum dropped warm into the wounded Tendon, with ſuitable Bandage to take off the Diſtraction. This holds true likewiſe in membranous or nervous and tendinous Parts, as well as in the Nerves and Tendons themſelves.

Q. 106. What is the Nature of contuſed and *Gun-ſhot Wounds?*

A. Theſe are always much more difficult to cure than an inciſed Wound even with leſs of Subſtance, becauſe here the Fibres and

Veſſels being lacerated, their Juices extravaſated, and their Fabric deſtroyed, makes a large Digeſtion or Suppuration previouſly neceſſary, to remove the morbid Parts, before the Wound can be incarned and healed; and hence alſo the Symptoms of Inflammation, Pain, *&c.* are commonly more violent in contuſed Wounds. They are more or leſs dangerous according to their Extent, and the Part in which they are ſeated. Thoſe which extend into the Bones, Viſcera or Joints, are of the worſt kind; and eſpecially when any of the Wadding, Cloths or Splinters are carried into the Part together with the Ball; for the Conſequences in theſe Caſes muſt be Inflammations, Gangrene, Caries, *&c.* which make an Amputation neceſſary. But Gun-ſhot Wounds in the Cranium are above all the moſt malignant and fatal; though we have often ſurpriſing Inſtances of Cures made by Art and the Efforts of Nature, even here when the Caſe has ſeemed deſperate.

Q. 107. How do you treat Gun-ſhot Wounds?

A. My Intentions are in the firſt place to ſuppreſs the Hæmorrhage; (2.) to extract all foreign Bodies, dead Fleſh, Splinters of Bones,

&c. (3.) to deterge or digeſt the Wound; and (4) to incarn and cicatrize. The firſt Intention is to be anſwered by the Fingers if poſſible, otherwiſe by Pliers, ſuitable Inſtruments, or a counter-opening, according to the Nature of the Circumſtances; carefully avoiding the Nerves, Tendons, Ligaments and Blood-veſſels in enlarging the Wound, or making the counter-opening. But if the Bullet be ſmooth, inacceſſible, and lodged in a ſoft muſcular Part, or in ſome Cavity of the Body, I often leave it behind, rather than extract it to the Patient's detriment; for we have frequent Inſtances of their making their own way out afterwards to the Skin, without Pain or Injury. In extracting a Ball by the Forceps (*Tab.* III. *fig.* 11.), they are not to be opened till their ends touch it, the Patient being at the ſame time held in the Poſture which he was in when it entered. If it ſticks in the Bone, I extract it by the Terebra, repreſented *Fig.* 3. *Tab.* B. If the Bone or Joint is much ſhattered by the Ball, as the Conſequences muſt be fatal, I make an Amputation as ſoon as poſſible; but if the Bone remains entire, or little injured, after removing the Fragments I forward the Suppuration by the common digeſtive Ointments; afterwards

deterge with *myrrh*, *aloes*, *præcip. rub. &c.* (avoiding this laſt when the Nerves lie bare) and then I incarn and cicatrize. If I perceive a ſpreading Mortification in the ſoft Parts, I preſcribe limits to it with a Pencil-bruſh dipped in *oleum vitrioli*, or in a Solution of *argentum vivum in aqua fortis*, diluted afterwards with water. This is ſometimes the only Reſort, as when a Mortification has extended to the Scapula; and it is likewiſe often of uſe in a Caries of the Bone: but, like other Corroſives, it requires Judgment in its Application, to avoid the Nerves, Tendons or Ligaments; and therefore I never uſe ſuch in the Joints, where it is more adviſable to ſcarify deeply, and apply a warm Mixture, *ex ol. tereb. theriac. ſp. vini camph. balſ. Peruv. &c.* — In the mean time I bleed the Patient at intervals, according as the Symptoms indicate, giving internally *tinct. vel extr. cort. Peruv.* to which may be added in caſe of Weakneſs, the *confectio Raleighan. vel Fracaſt. &c.* After the Wound appears perfectly clean, and affords a laudable Cream like Matter, as it incarns I take care to keep the divided Parts as much in Contact as poſſible, by keeping the Patient in a ſuitable Poſture, and applying ſuitable Compreſs and

Bandage, determine to act from the bottom upwards.

The Importance of being more particularly acquainted at this Juncture with the proper Methods of treating Gun-ſhot Wounds, will be Excuſe ſufficient for inſerting the following Extract from Mr. *Ranby*, whoſe ſuperior Judgment and Experience in theſe Matters muſt be allowed unexceptionable.

"The firſt Intention, in regard of Accidents cauſed by a Muſket or Piſtol-Ball, is, if poſſible, to extract the Ball, or any other extraneous Body that may be lodged in the wounded Part. And whenever theſe Caſualties are attended with a great Effuſion of Blood, from the Rupture of ſome conſiderable arterial Veſſel, it will be abſolutely neceſſary, with all imaginable diſpatch, to reſtrain the bleeding, by taking up the Artery with the Needle: and, at the ſame time, to be particularly careful that your Hold prove no ways eluſive. There is no depending on any Applications, however ſtyptic, on theſe occaſions.—In order to get at the Ball, or any other foreign matter that infeſts the Wound, I would adviſe probing or poking to be uſed as ſparingly as poſſible; having conſtantly experienced,

perienced, through the whole Courſe of my Attendance in theſe Caſes, that ſuch a Conduct is highly detrimental to the Patient. And, indeed, where probing is neceſſary, I would always prefer the Finger as the beſt and trueſt Probe. — If a Ball or any other Body happens to be lodged near the Orifice, or is perceptible by the Finger to lie under the Skin, though at ſome diſtance from the Mouth of the Wound; in the firſt Caſe it is requiſite immediately to remove ſuch extraneous Matter: and, on the other occaſion, to cut upon it, and take it out. But when it is ſunk deep, and lies abſolutely beyond the reach of the Finger, I could never bring myſelf to thruſt thoſe long Forceps the Lord knows where, with ſcarce any probability of ſucceſs. — A great number of Inſtances have occurred to me, where Balls have been quietly lodged in the Body; till, after many years, they have worked themſelves a paſſage towards the ſurface, and were conſequently very eaſily extracted. — In caſe the Wound be occaſioned by a Muſket or Piſtol-ſhot, and conſequently but ſmall, it will be altogether neceſſary to dilate it without delay. Yet, I think, in Wounds near a Joint, or in very membranous or tendinous Parts, the

Knife as well as Forceps ſhould be put under ſome reſtraint; nor any more opening made, than what is abſolutely requiſite for the free diſcharge of the Matter lodged within. Wounds in the Joints are always dangerous, let them proceed from whatever Cauſe, whether from a Bullet, or any cutting Inſtrument: and membranous or tendinous Parts muſt, paſt diſpute, ſuffer from their being thus expoſed to the very ſenſible Impreſſions of the Air.—I could produce many Inſtances of Balls going through muſcular Textures, and the Wounds being healed with very little trouble. And I have known Wounds of the Skull from a broad Sword, (where both Tables have been cut through, and a conſiderable Piece looſened) having been ſuffered to bleed for ſeveral hours, to do well; nor to be attended, or at leaſt very ſeldom, with any feveriſh Complaint. Which I am apt to attribute to the great quantity of Blood loſt immediately after the Parts had been injured. —If the Ball has gone quite through, both Orifices are to be widened, (if in a Part where it can be done with ſafety) and particular Care is to be taken to preſerve both Openings; that eſpecially which is the moſt depending. No Tents are to be made uſe of, where there is any poſſibility of avoiding them: and I would in general recommend light, eaſy Dreſſings, with a ſlight, moderate Bandage, juſt ſufficient to keep them on the Part. Thin Flannel is what I would prefer, in caſe it can be got.—Where the wounded Perſon has not ſuffered any great loſs of Blood, it will be adviſable to open a Vein immediately, and take from the Arm a good large quantity; and to repeat bleeding, as Circumſtances may require, the ſecond, and even the third day. This timely Precaution will prevent a good deal of Pain and Inflammation, forward the Digeſtion, and contribute towards obviating a long Train of complicated Symptoms, that are wont otherwiſe to interrupt the Cure, miſerably harraſs the poor Patient, and too often endanger his Life.——For the firſt twelve days it will be proper to obſerve a cooling Regimen, both in reſpect of the Medicines that may be preſcribed, and the Diet requiſite for the ſupport of Nature: and as, in Circumſtances of this kind, 'tis neceſſary the Body ſhould by all means be open; a Stool ſhould be every day procured, either by emollient Clyſters, or ſome gentle Laxative taken in at the Mouth.—Whatever Application is of a hot, ſpirituous nature, I find remarkably injurious on theſe occaſions, and what no wounded Part can in any degree bear. Let the firſt Dreſſing be with Lint, dry, or moiſtened with a little Oil, and a very light Bandage; the next with a Digeſtive warmed, and over it the Bread and Milk Pultice, mixed with a ſufficient quantity of Oil to keep it moiſt: and, where there is a great Tenſion, and the Wound large, a Fomentation. And this Courſe is to be continued, till the Sore is clean; and then it is to be healed according to Art. This Method will commonly promote a conſtant, eaſy Perſpiration, abate the Pain, very much facilitate the Digeſtion, and remove all Apprehenſions of any approaching Inflammation. What induces me to moiſten the Lint with Oil, is the Eaſe that is procured to a contuſed Wound from ſuch an Application, in compariſon of one of an abſorbent, drying diſpoſition; which, inſtead of giving free liberty to the ſanious Blood to diſcharge itſelf, and conſequently preventing an Inflammation by unloading the Part, would poſſibly obſtruct the Mouths of the capillary Veſſels, and hinder Nature from getting rid of that Incumbrance, which 'tis obſervable ſhe very much affects to throw off.—Should an Inflammation ſeize any Part, through the Lodgment of a Bullet, or any other foreign Body, that could with ſafety have been more immediately extracted; all Attempts for diſlodging ſuch extraneous Matter ſhould be poſtponed, till the ſwelling has in ſome meaſure ſubſided, and the inflammatory Diſpoſition of the Fibres is nearly vaniſhed: unleſs the Ball, or other extraneous Body, lies at no great diſtance from the Orifice; and there is, on that account, a Certainty of removing this Incumbrance without any material trouble to the Patient. — If a Wound be of ſuch a deſperate nature, as to require Amputation, (which is often the Caſe, when it happens in any principal Joint) it would certainly be of conſequence, could the Operation be performed on the Spot, even in the Field of Battle: leſt by adjourning it an Inflammation, which one may very reaſonably expect, ſhould obſtruct a Work, that ought rarely to be entered upon during the Continuance of ſo calamitous a Circumſtance. The neglecting this critical Juncture of taking off a Limb frequently reduces the Patient to ſo low a State, and ſubjects the Blood and Juices to ſuch an alteration, as muſt unavoidably render the ſubſequent Operation, if not entirely ly unſucceſsful, at leaſt exceedingly dubious. And in Wounds, even where no Amputation is required, 'tis equally adviſable not to defer the Care neceſſary to be taken of them; leſt, by the Parts being expoſed to the Air, there might ariſe a Series of very dangerous Symptoms.—Wounds, that border on any conſiderable Artery, are very apt to bleed afreſh upon Motion, or the Return of a free Circulation of the Blood into the Part, which was interrupted at firſt by the Violence of the Injury offered it: and this is almoſt always the Caſe, when the Slough begins to ſeparate. For which reaſon, one ſhould never attempt to remove it by force; but wait with patience, till there be a perfect Separation of this Slough: nor be in the leaſt wiſe ſhocked at the Accident of Arteries thus opening themſelves, which a very moderate Experience will convince one to be almoſt inevitable. The Patient frequently gives warning of what is coming upon him, by complaining of great Weight and Fulneſs in the Limb, which are ever accompanied with more or leſs Pulſation in it: an infallible Prognoſtic of the Conſequences. Let the Wound afflict whatſoever Part, if theſe Complaints attend it, I inſtantly enjoin bleeding and the

Bark. I have known ſeveral Inſtances of Perſons loſing their Lives from the ſtarting of an Artery, before the Surgeon could reach them; particularly where there has preceded an Amputation. And I dare affirm, the quantity of Blood loſt in ſome Caſes which I have obſerved to kill, has not amounted to twelve ounces: which I don't know how to account for otherwiſe, than by the Drain which had been made from the Maſs of Blood both before and during the Operation. Whence a ſudden Guſh, though of ſo moderate a portion of Blood, after the great quantity already loſt, gives a check to the Circulation, and cauſes immediate Death. This Reflection, I think, ought to be a Leſſon of Inſtruction to every Practitioner, to be particularly intent on the faithful Diſcharge of his Duty in regard of tying the Veſſels. —Repeated Bleedings in the beginning draw after them many Advantages. They generally prevent, and always leſſen, any feveriſh Aſſaults, and ſeldom fail to obviate Impoſtumations. The Body muſt ever be kept in a laxative State; and, when Pain puts it on the rack, immediate recourſe muſt be had to the ſovereign and almoſt divine Powers of Opium. — Next to this I likewiſe add the

Bark, a Medicine which no human Eloquence can deck with Panegyric proportionable to its Virtues. Of ſuch incomparable Benefit it is to Mankind! — I have known it procure Reſt, if given in large Doſes, when even Opium had been taken without any manner of effect. In all large Wounds, eſpecially thoſe made by a Cannon-ball, there is conſtantly a great Laceration of the Membranes, and Parts endued with an exquiſite Senſation. And theſe are ever attended with an excruciating Pain, and a Diſcharge of a gleety Matter; which, if not reſtrained, proves often of the laſt Conſequence. In this unhappy State, the Bark given in doſes of a dram each, and repeated every three hours, (or oftener, if the Stomach will bear it) with ſurpriſing Efficacy repairs the Breach made in the Conſtitution by this terrible havock. Elixir of Vitriol, taken three times a day, in a glaſs of water, I find to be of ſingular Benefit, and to prove a very good Aſſiſtant to the Virtues of the Bark. And, if the Body be coſtive, to each doſe of the Bark I add four or five grains of Rhubarb, till that Inconveniency is remedied. Should the Bark run off by more than four or five ſucceſſive Stools, I take care to check this Effect of it by ordering two or three drops of Laudanum, or two ſpoonfuls of the Diaſcordium mixture along with it, every time it is given. —Where the Sore diſcharges a conſiderable quantity of gleety Matter, is flabby, looks pale and gloſſy, (which Appearances are ever conſequent to a loſs of Subſtance) the Bark continually relieves the Pain that is predominant in this Caſe, thickens the Matter, leſſens its quantity, and quite changes the Complexion of the Wound. —It is very common in cachectic and ſcorbutic Conſtitutions, for a Sore, the firſt eight or ten days after taking off the Limb, to promiſe all imaginable Succeſs: from which time it frequently begins to gleet prodigiouſly, looks pale, gloſſy, and flabby; and, this gleeting if not checked, in a little while runs the Patient out of the World. In Exigences of this kind the Bark hardly ever fails to procure Relief, and works an apparent Change in a very ſhort ſpace of time: ſometimes in twelve hours."

From what has been here ſaid by Mr. *Ranby*, it is evident that the Bark is one of the beſt Remedies in contracting the Veſſels, and reſtoring their due Action upon the Blood, when too great a quantity of that neceſſary Fluid has been loſt by a profuſe Hæmorrhage, provided the wounded Veſſels are previouſly cloſed up, or well ſecured from a Return of the Hæmorrhage. It alſo not only ſecures the moſt tender Solids and ſmall Veſſels from being diſſolved by the Acrimony of any Matter abſorbed, and returned into the whole Maſs of Blood from large Wounds or latent Abſceſſes; but it likewiſe preſerves the Texture of the Blood itſelf from being too much broken, or rendered too watery from the ſame Cauſe, which would otherwiſe inevitably produce a fatal and colliquative Hectic. But where there is too great a Fulneſs, or too great a Strength and contractile Force of the Solids, and an inflammatory Tenacity or Sizineſs in the Blood, it may occaſion Obſtructions, Pains, Inflammations, and their Conſequences, unleſs it be timely laid aſide upon the appearance of ſuch Effects. Where the Blood is infected with a ſcorbutic and ſaline Acrimony, as it commonly is in Seafaring People, there ſhould be a plentiful uſe of *aq. calc.* previous to the Bark, to waſh out the more groſs, earthy and ſaline Parts, which might otherwiſe induce Rheumatiſms and the moſt ſtubborn chronical Diſorders.

Q. 108. How do you treat venomous Wounds?

A. Almoſt the only and moſt dreadful venomous Wound which we have to guard againſt in our Climate, is that from the Bite of mad Animals, whether Dog, Cat, Wolf, Ape, Man or Horſe, *&c.* and in this Caſe, as in all other venomous Wounds, if made in the Extremities, a ſtrict Ligature ought to be immediately applied, and the Part afterwards well ſcarified or cupped all over, eſpecially on and near the Wound, before the Ligature is taken off; and till this can be done, the Wound and adjacent Parts ſhould be inſtantly treated with the actual Cautery, which ſhrinks up the Veſſels, coagulates the Humours, and prevents them from returniug with the Poiſon into the Circulation: and even before this, it will be proper to open all the large conſpicuous Veins next to the Ligature as ſoon as it is applied, that the infected Blood may be evacuated, and drawn out as much as poſſible from the Part. After this, to prevent further Miſchief, the Patient ſhould be ſweated, cupped, and cold bathed once in twenty-four hours, and drink at leaſt *cong. j.* in that ſpace for a month together: but if notwithſtanding this, the

Symptoms of an approaching Hydrophobia begin to appear, the Patient muſt be bled largely to about 20 ounces in a day, till they abate; or if he ſhould not be able to ſwallow, it may not be amiſs to try to inject acidulated Juleps, and other cooling Liquors, by a ſmall Tube thruſt down the Gula. During the time of ſweating, it may be convenient to rub in ʒj of the mercurial Unguent, obſerving to keep it under from raiſing a ſtrong Salivation, by lenient Cathartics.

Q. 109. How do you diſtinguiſh Wounds of the Head?

A. According to the degree of their Penetration, into ſuch as only injure the common Integuments; ſuch as injure the Skull and dura Mater, and thoſe which affect the Brain itſelf: and as their degree of Danger depends upon that of their Penetration, therefore a ſtrict Enquiry ought always to be firſt made, how far a Wound in the Head penetrates or extends.

Q. 110. How do you diſtinguiſh whether the external Parts only are injured?

A. From conſidering the Nature and Violence of the wounding Inſtrument, by inſpecting and ſearching with a Probe, and by finding the Patient free from any violent Symptom; that is, without a Vertigo, Deafneſs, loſs of Speech, bleeding at the Ears, Mouth, *&c.*

Q. 111. How do you treat Wounds not penetrating the Cranium?

A. Theſe, eſpecially when contuſed, are often dangerous, and ought therefore to be carefully regarded, inaſmuch as the Diſorder may be propagated through the Cranium to the Brain itſelf; and even otherwiſe, from the Injury of the Pericranium, tendinous Expanſions, *&c.* may follow a deſtructive Fever, an Emphyſema, Oedema, Corruption of the Bone, *&c.* eſpecially if the external Air be freely admitted. Being therefore aſſured the Wound does not penetrate, I cloſe the bleeding Lips of the Wound carefully, and retain them with proper Bandage and Dreſſings, which I repeat ſeldom, and very expeditiouſly, to exclude the Air, and I carefully avoid oily, fat or rancid Medicines which foul the Bone. After the Hæmorrhage is ſtopped by the uſe of dry Lint, I dreſs with *mel roſarum* or *Fryer*'s Balſam, retained by a ſticking Plaſter and moderately tight Bandage, which will ſuffice for a ſimple Wound: but if there be any Contuſion, an Emphyſema or Lodgment of Air, an Oedema or deep Poſition of Serum, an Ecchymoſis or Extravaſation of Blood, ſeated either of them in the cellular Membrane, betwixt the Skin and Cranium, ſettling towards the Eye-brows; in this Caſe I make an Inciſion in the Scalp, or elſe open the Wound, diſcharge them by degrees, and prevent their Return by ſuitable Bandage and Compreſſure.

Q. 112. How do you proceed in caſe of a conſiderable Contuſion in the Scalp?

A. I firſt uſe a diſcutient Fomentation, *ex fol. rutæ ſcord. &c. cum ſal. ammon. crud.* boiled in Wine, to which is added a little Camphire before it is uſed. If this Method does not diſperſe the Contuſion, I endeavour to digeſt off the injured Parts *cum tereb. & vitel. ovi, gum elem. baſilic. flav. &c.* and over theſe I apply a Flannel dipped in the diſcutient Fomentation. Such Parts as are not digeſted off by this means, I remove by the Scalpel; being careful to avoid expoſing the Pericranium, by preſerving the Skin as much as poſſible, and perfectly diſcharging all the Matter, Sords, or other Humours; treating it afterwards as before, in *Q.* 111.

Q. 113. What are the Conſequences of a Wound injuring the Pericranium, and expoſing the Skull?

A. Since this Membrane is the Perioſteum ſupplying the nutritious Veſſels into the Bone of the Skull, if that be ſeparated, and the Bone expoſed to the Air, the Circulation will be deſtroyed through the exterior Lamellæ, whence the Humours will ſtagnate, corrupt, and foul the Bone, which will therefore exfoliate or throw off the dead and diſcoloured Scale or Lamella, which is more corrupted, in proportion as it appears of a darker Colour; and as this Foulneſs is the Effect chiefly of the Air drying up and deſtroying the Veſſels which run betwixt the Fibres of the Bone, ſo it will be neceſſary to procure or haſten an Exfoliation of that Lamella, which is now become dead, and, as a foreign Body, retards the Cure, and ſpreads the Diſorder, as long as it continues adhering to the living Parts.

Q. 114. How do you procure this Exfoliation?

A. This is performed by Nature, or the Motion and Dilatation of the living Veſſels next under the corrupted Lamella, which is by the Vibration of the Veſſels gradually raiſed and ſeparated. But as this advances ſo ſlowly as to take up above a Month, when left to Nature alone, in which time the Diſorder may ſpread, and many other Accidents happen, therefore it is adviſable to haſten the Separation by Art; not by the Cautery, Raſpitory or Scraper, which leaves the Work to come over again, but by perforating the expoſed Bone down to the Diploe, with many ſmall Apertures, by a common triangular Needle, or a Terebra of the like ſhape, by which means the ſubjacent living Veſſels having a free Paſſage, will emerge through the Foramina, and form a new Perioſteum, as ſoon as they have thrown the dead Scale off, or even without any Exfoliation at all, if the Bone is clean, as *Belloſte* judiciouſly obſerves. But while this is performing, I carefully avoid expoſing the Part to the Air as much as poſſible, by renewing the Dreſſings as ſeldom and expeditiouſly as may be; excluding the injurious Air by the Application of a Pledget dipped in *Fryer*'s Balſam, or by ſtrewing over ſome

Farina of the Gums, and renewing the Applications in a very warm Room, if it be in the Winter ſeaſon. This Method is applicable to the Exfoliation of all other expoſed Bones, as well as of the Skull.

Q. 115. What Injuries may the Skull itſelf ſuſtain from a wounding Inſtrument?

A. It may either receive a Fiſſure, Fracture, Contuſion, Depreſſion, or a loſs of Subſtance; and this either in one or both of its Tables at the ſame time.

Q. 116. How do you diſcover that the Skull is thus injured by a Fiſſure, Fracture, *&c.*?

A. (1.) By comparing the Nature and Violence of the wounding Inſtrument with the Wound itſelf; (2.) by inſpecting and ſearching with the Probe or a Tooth-pick, and the dropping of Ink upon the Part, then wiping it off, and obſerving if any black Line diſcovers a Fiſſure; (3.) by a Looſeneſs or Grating of the Bones, ſenſible to the Touch of the Finger, or to the Patient himſelf, if he bites hard upon any thing; (4.) from the Violence of the Symptoms; as intenſe Pains, Vomitings, Vertigo, Deafneſs, Loſs of Speech, Stupidity or Sleepineſs, with a bleeding at the Noſe, Ears or Mouth.

Q. 117. When is it neceſſary to expoſe the Skull?

A. In moſt Caſes where the Bones are injured, and in all where the Symptoms are malignant; as Convulſions, Lethargy, Palſy, Apoplexy, *&c.* denoting the Brain to be damaged, and that no time ought to be loſt: yet I am not forward to expoſe the Skull uppon all ſlight Occaſions, nor even where there is an apparent Fracture or Fiſſure of the Bones, provided no ill Symptoms attend; at leaſt I firſt try what can be done by Bleeding, Fomentations, and internal Medicines, according to the Obſervation of *Ruyſch*.[a]

Q. 118. How do you raiſe the Scalp in theſe Caſes?

A. By making an Inciſion with a gentle Preſſure through the Integuments, either by cutting round a Shilling or Half-crown, and taking out a piece entirely; or elſe by directing the Inciſion in the ſhape of an X V, or T, according as the Extent of the Injury and other Circumſtances indicate, ſeparating the Pericranium from the Bone with an Ivory Knife, and obſerving to avoid injuring the temporal and other Muſcles as much as poſſible; and if the Caſe be not urgent, I leave the Wound fill'd with dry Lint, till the Hæmorrhage is ſuppreſſed, to have a better view of the Parts.

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[a] Obſ. Anat. Chirurg. LX.

Q. 119. How do you proceed when a Contuſion or Fiſſure appears?

A. If the Bone ſeems diſcoloured and contuſed, I bore ſeveral ſmall holes with a triangular Needle, (or the Point *a*, *Tab.* D. *fig.* 1.) through the external Table to the Diploe, in order to diſcharge the extravaſated Humours, and make a way for the repullulating Veſſels to throw off the dead Scale.

Q. 120. When do you know this Terebration to be neceſſary?

A. From the Colour of the Bone, which is naturally of a pale, reddiſh, or pearl Colour; but if its Veſſels are dead, it appears firſt white, and then, as it corrupts, inclines to yellow, brown, livid, and at laſt becomes quite black; ſo that the Change of Colour denotes the greater or leſs degree of Corruption in the Bone.

Q. 121. Why is a Fiſſure often more dangerous, than a Contuſion or Fracture?

A. Becauſe it is more difficult to diſcover; whence the Bone is often neglected, under a ſuppoſition of its being ſound, while the Diſorder in the mean time is ſpreading through the Diploe, and extending to the Brain, becomes at length fatal of a ſudden, when the Cauſe is not the leaſt ſuſpected: but if the Bone appears diſcoloured in a Fiſſure as in a Contuſion, it muſt be perforated with the Terebra as before, which is much preferable to the Methods formerly uſed by ſcraping, raſping, *&c.*

Q. 122. What do you underſtand by a *Depreſſion* of the Skull?

A. This is either, proper when the Bones are thruſt inward without a Fracture, as happens from their Softneſs in Children and Infants; or improper, when the Bones are indented towards the Brain with a Fracture, which muſt inevitably happen in Adults, from the Hardneſs and Inflexibility of the Bones: in either of which Caſes there is a greater or leſs Obſtruction, and a Deſtruction of the Veſſels in the Brain; whence a Lethargy, Convulſions, Palſy, Apoplexy, and even

Death itſelf follows, without timely Relief be given.

Q. 123. How do you raiſe a *Depreſſion* of the Skull?

A. After opening the Integuments in young Children, I firſt attempt it by a ſticking Plaſter, to the Center of which is faſtened a Tape, whereby it is pulled up ſuddenly from the Bone, and acts like a Sucker, as in *Tab.* D. *fig.* 2.; but if the Bones are hard, in an adult Patient, I attempt it by the Screw *b*, *fig.* 1. *Tab.* D. or Elevatory, *fig.* 3, 4. *Tab.* D. or if the Fragments are too looſe to ſuſtain that Inſtrument, I trepan in the neareſt ſound Part of the Bone, and endeavour to force it from within outward by a Lever *c*, *fig.* 1. *Tab.* D. directing the Patient in either Caſe to ſneeze or cough at the inſtant the Elevation is attempted, that the Brain, being diſtended with Blood and preſſed outward, may aſſiſt the Elevation.

Q. 124. In what Caſes, and to what Parts of the Skull do you apply the Trepan or Trefine?

A. (1.) In all Fractures where the Brain is injured, and the Symptoms malignant; (2.) for Depreſſions or Indentations of the

Skull, which cannot be raiſed without; (3.) and laſtly, in all Caſes where the Contuſion and Extravaſation in the Blood-veſſels of the Brain is ſo great, as not to admit of being diſperſed by profuſe Bleeding, Purging, Bliſtering, Clyſters, and proper internal Remedies: yet am I not ſo forward as ſome for uſing the Trepan upon every ſlight occaſion, until I ſee what can be done by the aforementioned preceding Method; being careful in the mean time not to let the Caſe run too far: but if the Symptoms mentioned are urgent and inflexible, I directly proceed to trepanning, which, though a doubtful Operation, may ſometimes ſucceed, by giving a Vent to the extravaſated Humours, removing the Compreſſure of the Brain, and preventing Suppuration and their Conſequences.

Q. 125. What Parts of the Skull admit not of the Trepan?

A. The Trepan cannot well be applied (1.) upon a Suture, becauſe the dura Mater being inſerted into the Sutures, it will be not only an extreme difficulty to raiſe up the trepanned Piece, but it muſt alſo lacerate that Membrane, whence the worſt Conſequences might follow. (2.) It cannot well be applied upon thoſe Parts of the occipital and temporal Bones, which are covered with thick Muſcles; though in Caſes of the laſt Neceſſity the Trepan has been ſometimes ſucceſsfully applied here, after ſeparating the temporal Muſcle from the Bone. (3.) The Trepan cannot be uſed upon the frontal Sinus, not only becauſe it is oppoſed by the Make of the Bone here, but becauſe it would leave an incurable fiſtulous Ulcer behind. (4.) We cannot trepan ſafely over conſiderable Arteries of the dura Mater, where we obſerve their Impreſſions in dried Skulls, as in the parietal Bones, *&c.* (5.) It cannot be applied towards the Baſis of the Skull; though when the extravaſated Humours are lodged there, they may be ſometimes forced up to a ſuperior Opening. All theſe Places are to be avoided, if poſſible; but when the Caſe ſeems inevitably fatal without the Aſſiſtance of the Trepan, it is better to try a doubtful Remedy than none, and, even againſt theſe Cautions, to make an Opening as near as poſſible to the Part injured.

Q. 126. How do you know which Part of the Brain is injured?

A. (1.) By carefully examining the Head after it has been ſhaved, and enquiring of the Patient or By-ſtanders; (2.) from the ſpontaneous Motion of the Patient's Hand to a particular Part of his Head, even though he be ſenſeleſs; (3.) from obſerving which ſide of the Body is paralytic, and which ſide convulſed; for the Diſorder is always found on the convulſed ſide: but even if the Symptoms urge, the Trepan ought to be applied at diſcretion, firſt to one Part and then to another, till that affected is diſcovered. Thus if the Patient continues ſtupid, convulſed, bleeding at the Noſe, Ears or Mouth, *&c.* and no Signs appear to direct the Trepan, it may be uſed upon each of the parietal Bones, upon the frontal and occipital, all round the Skull.

Q. 127. Which do you prefer, the Trepan or the Trefine?

A. As theſe Inſtruments commonly differ, not in their moſt eſſential Part, but only in the Handle, either of them will therefore perform the Office very well: but the Trepan having a verſatile Handle, like the Borer uſed by Coopers, requires the uſe of both Hands to apply it; whereas the Trefine, having its Handle fixed like a common Wimble or Nail-piercer, requires but one Hand to guide it round. But upon the whole, as the Trefine is more handy, and can be more eaſily preſſed harder on one ſide or the other, according as it may be found neceſſary, it ſeems the more eligible of the two; and has accordingly prevailed with moſt of the *Engliſh* Surgeons, as the Trepan is moſtly received by the *French*, *Germans*, and other Foreigners. But unleſs the Crown of the Trefine be made with its Teeth leaning, or aſcending ſpirally one over the other, and inclined but little from the Cylinder towards the Cone; it will work very ſlowly. I therefore prefer the Trefine, whoſe Crown is a Fruſtum of a very long or extended Cone, which makes it cut ſooner through the Bone, and yet ſo much more enlarges the Opening without than within, as to give free liberty for Inſpection to the Eye. It may indeed be ſaid in favour of the Trepan, that it works quicker, and that the Preſſure being more equally diſtributed to the Teeth of the Crown, it cuts a more even Circle of an equal depth; but in this Operation one muſt proceed ſlowly and cautiouſly, and the Bone being often of an unequal thickneſs, requires to be cut more on one ſide than on the other. In ſhort, I ſhould chuſe the Trepan to perforate the outer Table, and the Trefine to finiſh the Operation, were it not for employing two Inſtruments for what may be done by one.

Q. 128. How do you apply the Trepan?

A. After the Bone is ſufficiently expoſed, and the Hæmorrhage ſuppreſſed, the Head being ſupported in a proper Poſture, I firſt take the perforating Trepan (*fig.* 6. *Tab.* E.) and fix it in the Handle *b*, *fig.* 1. inſtead of the Crown *a*, to make a ſmall Entrance; then fixing on the Crown *a* with its Spindle *e*, I proceed to turn it round ſlowly and lightly, till the Teeth have made a circular Entrance; then taking out the Spindle, I continue to work the Crown by itſelf pretty briſkly till it has reached the Diploe, taking out the Inſtrument, and bruſhing off the Saw-duſt now and then, both from its Teeth and from the Bones, by the Bruſh (*fig.* 7. *Tab.* E.) But conſidering that in ſome People, and in ſome Parts of the Skull, the Diploe is abſent, I therefore proceed after a while more ſlowly, and with more Caution; frequently inſpecting and ſearching the depth and equality of the Ring with a Tooth-pick.

When I judge the Bone to be cut a little more than half way through, I fix in the ſmall Screw *b*, (*fig.* 1. *Tab.* D.) and giving it an Entrance by two or three turns in the Center, take it out, and proceed to work the Teeth of the Crown hardeſt upon that ſide of the bony Circle which appears thickeſt or whiteſt, preſſing leſs upon that ſide which appears thin by its livid or blue Colour; and thus I proceed cautiouſly to avoid wounding the dura Mater, till the bony Segment is looſe, and adheres to the reſt by very few Fibres; at length removing the Trepan, I ſcrew in the Terebra *b*, (*Fig.* 1. *Tab.* D.) and draw out the Piece before it is quite cut through. The Edges of the Bone next the dura Mater are now to be ſmooth'd by the lenticular, (*Fig.* 4. *Tab.* E.) the Splinters are removed from the dura Mater, together with the Blood, by applying ſome Lint, reſtraining the Hæmorrhage (if neceſſary) by moiſtening with *ſp. vini:* and if, after all this, Blood or Matter appears confined under the dura Mater, an Inciſion is made through it by the Lancet, to give a Diſcharge, and to extract the Splinters, if any are lodged under it; but in doing this, I am cautious to avoid wounding any of the Arteries, Veins, or Sinus's of the Meninges. If this does not ſuffice for the removal of the Splinters, Fragments or extravaſated Humours, I repeat the Operation again, where it ſeems neceſſary, in the manner before deſcribed.

Q. 129. How do you dreſs after the Operation?

A. After the Fragments and extravaſated Humours are removed, if the dura Mater is not perforated, I apply a round Pledget of dry Lint (*Fig.* 9. *Tab.* E.) with a Thread faſtened to it, arming it with a little *mel roſarum* and *Fryer*'s Balſam mixed together; then impoſe another Pledget of dry Lint, *Fig.* 10. over that another large one, *Fig.* 11. ſpread with ſome Digeſtive, upon the Integuments; then a Compreſs dipped in *ſp. vini camph.* and ſecure the whole by a Plaſter and the capeline Bandage (*Fig.*14. *Tab.* E.) But if the dura Mater is laid open, and the Brain expoſed, to prevent it from riſing up into a Fungus, for want of the reſiſting dura Mater and Skull, I apply a Plate of Lead (*Fig.* 12. *Tab.* E.) perforated with ſmall Holes, and bent like two Handles, as at *Fig.* 13. adapting it to the Aperture of the Skull, and placing over it ſome dry Lint to abſorb the

Humours, which eſcape through the Perforations, compleating the reſt of the Dreſſing as before.

Q. 130. What Cautions do you judge neceſſary in relation to Wounds of the Head?

A. (1.) That ſuch Wounds ought not to be deemed ſlight, eſpecially when attended with vomiting, and other bad Symptoms, which denote the Skull or Brain to be injured. (*Q.* 116. (4).)

(2.) That the Blood-veſſels of the dura Mater and Brain may be injured by Concuſſion without a Fracture of the Skull, whence Death may follow, if the extravaſated Blood is not removed by the Trepan.

(3.) If Blood or Matter appears lodged between the dura and pia Mater after trepanning the Skull, an Inciſion muſt be made through the former to diſcharge it.

(4.) That rancid, oily or fat Subſtances in any Form ought not to be applied to Wounds of the Head, ſince they are more or leſs a Cauſtic, and diſpoſed to create or ſpread a Caries.

Q. 131. How is your capeline Bandage made.

A. With a Piece of Linen two fingers broad and ſix ells long, rolled up with two Heads, the middle of which being fixed upon the Occiput, the Rollers are croſſed upon the Forehead, and one of them carried acroſs over the Vertex and ſagittal Suture, *Fig.* 14. *Tab.* E. and the other Head is carried in a Circle *b*, *c*, till it has croſſed the other; and thus the two Heads of the Roller are continued, one croſſing over the Scalp, and the other continued round it, in the Courſe *c d*, *e f*, *g h*, *&c.* till it is covered, terminating the Bandage at laſt, by bringing one end over the ſagittal Suture *a*, and pinning the other end in the Circle *b c*.

Q. 132. How do you diſtinguiſh and treat Wounds of the *Neck?*

A. Theſe according to the Nature of the Parts wounded are more or leſs dangerous. Such as penetrate into the carotid Artery, or internal jugular Vein, ſoon kill the Patient by a fatal Hæmorrhage, unleſs a Surgeon is at hand to open the Integuments, and tie up the Veſſel; and in that caſe the Patient may be ſaved, though the Courſe of the Blood on that ſide the Head be intercepted, as we learn by Experiments on a Dog. If the

Windpipe only is wounded with the external Jugulars, the Caſe is not ſo dangerous as might be imagined, provided it is not quite cut in two, ſo as to let the lower Part contract into the Thorax. Here the divided Parts are to be brought together by Suture with a Needle and thread, or by introducing two Needles, one in the upper, and the other in the lower part of the Trachea, (ſo however as to avoid injuring the internal and very ſenſible Membrane) afterwards binding them together with a thread after the manner of the Hare-Lip, *Tab.* C. *fig.* 9. and when the Trachea is united, the Wound then may be healed after the common Method (*Q.* 89, *& ſeq.*) — Such Wounds of the Neck as penetrate the Gula, are very dangerous, and rarely cured, becauſe of its Action in Deglutition, in which the Aliments eſcape and corrupt about the wounded Part; and are commonly attended with a troubleſome Hiccup or Vomiting. Such Wounds of the Neck as divide the Par vagum and other large Nerves, which ſupply the Viſcera of the Thorax and Abdomen, are always fatal in time (though not immediately) by inducing a Palſy of thoſe Organs.

Q. 133. How do you diſcover a Wound penetrating the Cavity of the Thorax?

A. By the Probe; by holding a Wax-Candle againſt the Wound, and obſerving if any Air enters or returns, while the Patient lies in the Poſture wherein he received the Wound; by injecting ſome Liquor which is refuſed a Paſſage, and from the Signs of the Lungs adhering to the Pleura of the Part wounded: but even the Matter formed in a Wound which does not penetrate, may by degrees make its way through the Pleura, ſo as to produce an Empyema with all its Conſequences; and therefore Care ſhould be taken to procure a free Exit to the Matter in theſe Wounds, by making no Preſſure or Obſtruction at their Orifice.

Q. 134. What Effects follow from a Wound penetrating the Thorax?

A. They are an Obſtruction of the Breathing, and the Circulation of the Blood through the Lungs; an Extravaſation and Spitting of Blood; an Empyema purulent, hectic, *&c.*

Q. 135. How do you know Blood is extravaſated in the Thorax by a Wound penetrating its Cavity?

A. From the Oppreſſion or Difficulty of breathing; from the Patient lying eaſy only upon his Back, not being able to lie on the ſound ſide, nor without great uneaſineſs upon the wounded; by the preſent Effects of a Wound thus penetrating, as laſt mentioned (*Q.* 134.); and finally, from the Fluctuation, an Oppreſſion upon the Diaphragm, attended with great Weakneſs, Paleneſs, and cold Sweats.

Q. 136. How is an Emphyſema ſometimes produced in theſe Wounds?

A. This is a flatulent Diſtenſion of the cellular Membrane, by the Air forcing its way through the Lips of the Wound into the Cells, after it has been confined and rarified in the Cavity of the Thorax, into which it is often poured thro' the wounded Lungs; for when once the Air has thus made its way into the cellular Membrane, it ſoon ſpreads throughout the whole Body, and cauſes a ſoft pellucid Tumor immediately under the Skin, except at the Soles of the Feet and Palms of the Hands, cauſing a Tumor in ſome places near a foot thick; as in the Hiſtory mentioned in *Mem. Acad. ann.* 1713. *p.* 15, 18, 119, *& ſeq.* To prevent this therefore, the cellular Membrane muſt be compreſſed:

compreſſed at the Wound, and the Flatus which has once enter'd it muſt be diſcharged, by Compreſſure, through an Inciſion of the Integuments.

Q. 137. How do you treat a Wound penetrating the Thorax?

A. The firſt Intention is to diſcharge the extravaſated Blood as ſoon as poſſible, by placing the Patient in a convenient Poſture; by diluting it with ſome deterging Liquor injected, and then extracting both by the Syringe, *Fig.* 1. *Tab.* F.; laſtly, by dilating the Wound, or making a new Opening betwixt the ſecond and third of the lower falſe Ribs, at about a hand's breadth from the Spine, and as much from the lower Angle of the Scapula, directing the Inciſion in a parallel Courſe betwixt the Ribs, with the back of the knife upward, and the edge inclined downward, the point being obtuſe, as in *Fig.* 2. *Tab.* B. to avoid injuring the Lungs, and to avoid wounding the intercoſtal Veſſels, which run along the lower ſide of each Rib. While this is performing, at firſt the Patient ſhould incline backwards, that the Skin and latiſſimus dorſi Muſcle may be more eaſily taken up and inciſed; then leaning forward, the

Inciſion may be made through the tenſe intercoſtal Muſcles and Pleura in the Center betwixt the two Ribs. If the Lungs ſhould adhere to the Pleura in that part, one muſt be very cautious not to wound them, but to carefully and gently ſeparate them by the finger: but if the whole ſide of the Lungs ſhould adhere to the Pleura, ſo that they cannot be ſeparated; this indeed muſt render the Operation uſeleſs, but cannot give occaſion of any juſt Reflection upon the Surgeon.

Q. 138. How do you diſcharge the Air which has entered into the Cavity of the Thorax?

A. By ordering the Patient to fetch as deep an Inſpiration as poſſible, and then by cloſing the Lips of the Wound together immediately after the Air is expelled by the Expanſion of the Lungs: but it will be in vain to attempt this exact Excluſion of the Air, until the Thorax is perfectly freed from the extravaſated Humours; and when once it is performed, great care muſt be taken to prevent the Air from entering again.

Q. 139. How do you treat theſe Wounds when they penetrate the Lungs?

A. If any of the large pulmonary Blood-veſſels are divided, a fatal Hæmorrhage preſently enſues; or if their cellular Subſtance only is wounded, an Hæmopthoe enſues more or leſs, and the Wound heals more ſlowly than it otherwiſe might, on account of the inceſſant Motion of this Organ. In this Caſe therefore the Patient is to be reduced as low as poſſible, by bleeding when neceſſary, uſing a liquid, ſpare and cooling Diet, and abſtaining from every thing which ſtimulates or increaſes the Blood's Motion; and eſpecially if a Cough attends, that muſt be allayed by lenient Purges, Balſamics, and Opiates when neceſſary.

Q. 140. How do you diſcover that a Wound penetrates into the Abdomen?

A. By the ſame Methods as in a Wound which penetrates the Thorax before-mentioned (*Q.* 133.)

Q. 141. What are the Conſequences of a Wound here, which penetrates no deeper than the Peritonæum?

A. Unleſs proper Care be taken, the Inteſtines, Omentum, and other Viſcera being urged downward by the Diaphragm at every Inſpiration, will diſtend the Peritonæum into a Sacculus, and thruſt out the Inteſtines where the Integuments give the leaſt Reſiſtance, ſo as to form an Hernia; which may be of the moſt fatal Conſequence, when the Wound runs obliquely betwixt the Muſcles, or is not timely diſcovered and relieved.

Q. 142. How do you diſcover that the abdominal Viſcera are wounded?

A. If warm Water injected returns colourleſs, and if the Patient is not afflicted with any violent Symptoms, I conclude they are ſafe; but if a violent Fever, Vomiting, Hiccup, *&c.* appear, while the Injection returns diſcoloured, there is reaſon to ſuſpect ſome of them injured: but which of them it is, I conclude from the Make and Extent of the wounding Inſtrument, the Courſe of the Wound, and its Situation with reſpect to the Regions of the Abdomen and their ſeveral contained Parts; as alſo from the Matter which is diſcharged from the Wound: if the Chyle or Aliments are diſcharged in their crude State, I conclude that the Stomach or ſmall Inteſtines are wounded; if the Fæces are diſcharged, the large Inteſtines; if a great quantity of ſerous and bilious Liquor is extravaſated, the Direction of the Wound being towards the Liver, while the Inteſtines loſe their periſtaltic Motion, and are not obedient either to Purges or Clyſters, the Patient being reſtleſs and without Fever, I conclude the Gall-bladder or Duodenum to be wounded, which is a Caſe of the greateſt Danger; if the Urine is made bloody, the Kidneys are probably injured; but if the Urine is diſcharged through the Wound, either the Bladder or Ureters are wounded; if the moſt acute Pain, Fever and Inflammation attend, and riſe upward towards the Throat, without a Diſcharge of the forementioned Humours, the Meſentery is probably wounded, which is commonly fatal: ſo that from conſidering the Nature of the Wound, the Inſtrument, and the ſeveral Viſcera of the Abdomen, with their injured Functions, one may nearly eſtimate the Danger and Conſequences of Wounds penetrating the Abdomen, and injuring its Contents.

Q. 143. How do you treat a Wound penetrating the Abdomen, without injuring the Viſcera?

A. If the Wound be very large, the Inteſtines and Omentum appearing ſound, I return them with all convenient ſpeed, then unite the Peritonæum and Integuments together by the interrupted Suture (*Tab.* C. *fig.* 4.); which is likewiſe neceſſary in large tranſverſe Wounds of the Abdomen, even if they do not penetrate the Peritonæum. But firſt, if the Inteſtines are wounded, I unite them looſely with the Glover's Suture; and if any Part of the Omentum appears gangrenous, livid, and cold, I amputate it: but if the Inteſtines, being ſound, are ſo diſtended with Flatus, that they cannot be returned, either the Wound muſt be enlarged, or a ſmall Puncture made through the Inteſtine by a tubulated Needle to let out the Flatus. The thread with which the Inteſtine was ſewed, or the Omentum tied before its Amputation, muſt be left out of the Abdomen, in order to bring thoſe Parts to view at the Mouth of the Wound, and to extract the threads when neceſſary; or that if the Inteſtine ſhould mortify, the Extremity of it may be brought to the Mouth of the Wound, and there agglutinated to form an artificial Anus, of which we have numerous Inſtances. But in ſmall longitudinal Wounds of the Abdomen, eſpecially in fat People, the Suture muſt be omitted, and the Parts united by Bandage and Compreſs, with ſticking Plaſters; always obſerving to keep a ſmall Opening for the Diſcharge of Humours that may be contained in the Abdomen, by filling the Aperture with dry Lint ſecured by a thread. But as the Suture of the Inteſtines is commonly attended with Inflammation and fatal Conſequences, therefore ſome of greateſt Note chuſe only to paſs a waxed thread round the divided Extremities, ſo as to bring them to the Mouth of the Wound, and there procure them to unite, either together, or to the Peritonæum itſelf; though there are ſeveral Inſtances where the Suture has ſucceeded, not only in Wounds of the Inteſtines, but alſo in the Stomach; but Care muſt be taken to repeat the ſtitches as ſeldom as poſſible, and not to draw the threads too tight.

Q. 144. How do you treat the Patient when there is a conſiderable Part of the Inteſtine loſt, either by Inciſion or Mortification?

A. Though ſuch a Caſe might at firſt View appear deſperate, yet as we have numerous Inſtances of the upper Part of the

Inteſtine growing naturally to the Lips of the Wound, and forming a new kind of Anus; therefore the Margin of the Inteſtine is to be ſtitched to the Lips of the Wound, where uniting, it will become muſcular and ſtrong after ſome time, ſo that the Patient may ſurvive only with the Inconveniency of wearing conſtantly a tin or ſilver Receptacle for the Fæces, which will be continually diſcharging, but are not near ſo offenſive as thoſe which come naturally from the larger Inteſtines. The ſame Method muſt be taken when the Inteſtine is mortified, after having amputated the dead Part.

Q. 145. How do you treat the Patient with reſpect to Medicines and Diet in theſe Wounds?

A. As here nothing is more to be feared than an Inflammation of the Viſcera, which after the moſt excrutiating Pains may turn to a Gangrene, and deſtroy the Patient; therefore bleeding muſt be frequently repeated at diſcretion, while cooling Medicines are uſed internally, and the Patient kept upon a healing liquid Diet, which affords no Fæces to load the Bowels; ſuch as ſmall Fleſh-broths a little acidulated with *Seville* Orange or Limon Juice; Broths of Eels or Cray-fiſh, clarified Whey, Jellies, Juice of boiled Turneps, *&c.* In the mean time the Patient muſt be kept at reſt in a convenient Poſture, with his Head and Breaſt raiſed conſiderably high, not neglecting the frequent uſe of emollient Clyſters, when the Wound does not penetrate into the large Inteſtines, which ſurrounding the ſmall ones and the adjacent Viſcera, will communicate the Warmth and diſcutient Efficacy of the Clyſter, almoſt as well as if it was a Fomentation immediately applied to the Parts themſelves; but if the large Inteſtines are wounded, it is evident that the only Streſs muſt be laid upon Laxatives, with cooling and diluent Medicines adminiſtered by the Mouth, ſince Clyſters would be extravaſated by the Wound into the Cavity of the Abdomen.

Q. 146. How do you treat the Patient, when the other abdominal Viſcera are wounded?

A. In the manner before-mentioned (*Q.* 145.), only with the addition of healing Injections into the Cavity of the Abdomen itſelf, taking a particular Care to prevent any of the animal Humours from ſtagnating and corrupting in that Cavity, and excluding the acceſs of the external Air as much as poſſible, as it is a principal Cauſe in corrupting or putrifying the Juices.

Q. 147. How do you dreſs after Wounds in the *Thorax?*

A. After the application of Lint, either dry or ſpread with ſome Balſam, with Emplaſter and Compreſs, I apply the Napkin and ſcapulary Bandage uſed in the Paracenteſis, and moſt other Diſorders of the Thorax. It is made with two pieces of Linen, the one an ell or more in length, according to the Bulk of the Patient, and a yard wide, which is like a Napkin, to be folded four or ſix times together, and then cloſely applied round the Body over the Dreſſings, where the two Extremities are to be faſtened either by Pin or Suture, as in *Tab.* S. *fig.* 1. but to prevent this Napkin from ſubſiding, it is to be faſtened to the two ends of the Scapulary before and behind; which laſt is a ſlip of Linen, about a yard long, and about a hand's breadth, ſlit in the middle to tranſmit the Head and Neck; or elſe, which is the more commodious way, it may be ſlit up at each end almoſt to the middle, which being applied to the back part of the Neck, two of the ends are brought over the ſhoulders, croſſed upon the Sternum, and then faſtened laterally to the Napkin on each ſide *a*, *d*; and in the ſame manner are the other ends to be croſſed and faſtened behind the Back.

Q. 148. How do you dreſs after Wounds in the *Abdomen?*

A. After ſlight or ſmall Wounds, the Napkin and Scapulary before deſcribed (*Q.* 147. *Tab.* S. *fig.* 1. B C.) will be ſufficient to retain the Dreſſings: but here I firſt apply the uniting Bandage (*Tab.* II. *fig.* 30.) or elſe a double-headed Roller after the dry Suture, in order to retain the wounded Lips together; avoiding the true Suture as much as poſſible, except when the danger of a Hernia, or the tranſverſe Courſe of the Wound makes it abſolutely neceſſary.

Q. 149. How many Kinds of *Fractures* do you make?

A. They may be diſtinguiſhed into three Species, according as they are attended more or leſs with other Symptoms; namely, into ſimple, compound, and complicated. *Simple Fractures* are thoſe, where the Bones are divided only in one Part, without injuring the adjacent ſoft Parts, as commonly happens when the Radius or Fibula only is fractured, the Ulna or Tibia ſuſtaining the ſoft Parts and the fractured Bone in the mean time. But a *compound Fracture* is when a Bone is broke into ſeveral Fragments without any violent Symptoms; but if attended alſo with a Wound, Contuſion, Inflammation, Hæmorrhage, *&c.* it is then termed a *complicated Fracture*; namely, when theſe Symptoms require a Treatment diſtinct from that of the Fracture itſelf.

Q. 150. What are the Signs and Effects of a *compound* or *complicated* Fracture?

A. They are chiefly a Collapſion and Deformity of the Parts, with a Contraction and Diſtortion of the Muſcles for want of their bony Support; a Laceration of the Perioſteum and adjacent Veſſels, Membranes, Nerves or Tendons; whence Inflammation, Convulſion, Ecchymoſis, Suppuration, Gangrene, *&c.* may follow, according to the degree of Complication and Injury, with the Nature or Fabric of the Part.

Q. 151. What are your curative Intentions in a Fracture?

A. They are, (1.) To replace the Fragments by Extenſion and Reduction, ſo as to reſtore the Bone to its natural Situation: (2.) To retain them in that Poſture by Compreſs, Bandage, and ſuitable Inſtruments; (3.) To forward the Conſolidation by a growing Callus, and to treat the concomitant Symptoms, as may be found neceſſary. The firſt of theſe Intentions I compleat by placing the Part in its natural Poſture, and making a ſlow Diſtraction of the Fragments from each other in a right Line, till the contractile force of the Muſcles is overcome; and this I do either by the Hands, Slings or Machines, while the Patient is held firm.

Q. 152. Do you directly execute theſe Intentions in every compound Fracture?

A. If it is attended with any violent Inflammation or Tumor, it is adviſable here, as well as in a Luxation, previouſly to palliate and leſſen the Symptoms before the Reduction is attempted: if any protuberant Splinters or looſe Fragments ſeem to hinder the Extenſion and Reduction, they ought to be firſt removed by Inciſion, if they cannot without; but if the Bone is much ſhattered, ſo as to deſtroy the larger Veſſels, *&c.* an immediate Amputation ſhould be made to prevent worſe Conſequences, if nothing forbids.

Q. 153. How do you know when the Fragments are properly reduced?

A. From a previous Acquaintance with the anatomical Structure of the Parts, from the Removal of the Pain, and from comparing the Figure and Length of the injured with the ſound Limb.

Q. 154. How do you retain the Fragments in their natural Poſition?

A. By the application of ſuitable Bandages, Bolſters and Splints, with other Machines, keeping the Limb at reſt, and duly ſuſtaining or directing the Actions of the Muſcles, varying the Apparatus according to the particular Nature of the Fracture.

Q. 155. What Time is required to firmly conſolidate the Bones by a *Callus?*

A. This will take up from one to two months, more or leſs, as the Patient is younger or older, of a good or bad habit, the Bone larger or ſmaller, and the more or leſs incumbent Weight it muſt ſuſtain.

Q. 156. What practical Cautions do you judge moſt neceſſary to be obſerved, with reſpect to Fractures in general?

A. 1. To avoid diſturbing the Bones by extending or moving them, if they ſhall be at firſt found in their natural Situations; Retention and Deligation alone being in that Caſe ſufficient.

2. To cautiouſly avoid too ſtrict a Bandage, which may produce a Tumor, Gangrene, and the worſt Conſequences; and yet to order them ſo as to ſit moderately firm, conſidering that after their firſt application they will ſtretch and looſen a little.

3. If the Fracture be attended with great Pain, Inflammation and Tumor, not ariſing from Splinters; in that Caſe the Patient muſt be bled, and the Parts treated with antiſeptic Fomentations: but if theſe Symptoms ariſe only from the Irritation of the bony Fragments, it is beſt either to remove or replace them immediately with a due Extenſion, proportioned to the Age of the Patient and Strength of the Limb.

4. To be particularly careful to make a ſlack Deligation, when there are looſe Fragments; and to relax the Bandage, if the Inflammation increaſes; and if that with bleed-

ing the Patient, a Removal of the Splinters, *&c.* prove ineffectual, a Gangrene and Sphacelus being threatened, the Part ought to be timely amputated.

5. To avoid the application of Ointments, Oils, or ſticking Plaſters to the Skin, when there is any degree of Contuſion; leſt theſe cauſe a Suppuration by obſtructing the Pores and heating the Part, which ought rather to be treated with diſcutient Fomentations.

6. To obſerve that if a Fragment is large, ſtill adheres to the Perioſteum, and is capable of being reduced without much Injury to the ſoft Parts, it ought not to be extracted or cut off, and the reverſe.

7. To obſerve that the Limb be carefully and gently moved in its Articulations every day, to diſperſe the Synovia, and prevent a Stiffneſs of the Joints; and this more eſpecially if the Fracture, being ſeated near the Articulation, gives the Callus an opportunity to ſhoot up and form an Anchyloſis, by cementing the Heads of the Bones, or ſtopping up the Cavity of the Joint.

8. To avoid the common Cuſtom of applying Bole or other ſticking Plaſters immediately to the Skin, not only in Fractures but in Luxations, when it is much better to ap-

ply a Compreſs dipped in *oxycrate*, *ſp. vini, camph. &c.* becauſe the former are not only troubleſome to remove, but likewiſe obſtruct the Perſpiration, and often inflame the Part, at the ſame time that they afford little or no uſe as a Retentive.

9. That if the Bones in a ſimple Fracture ſhould by any Accident be united in an improper Poſture by the Callus, ſo as to endanger a Deformity or Lameneſs; if the Callus be recent, or not too much indurated, and the Patient ſtrong and of a good Habit, it may be proper to ſeparate the Bones again, and reduce them to their juſt Poſitions by breaking the Callus; but this not without the Advice and Aſſiſtance of one well experienced.

10. To obſerve that in young and warm Habits, the Circulation ought to be moderated at diſcretion, by Bleeding, ſpare and low Diet, *&c.* in order to prevent a Luxuriancy of the Callus: and that to forward the Formation of it in old and weak Habits, the Patient's Strength muſt be kept up with Cordials, and plenty of good Nouriſhment.

Q. 157. What is a *Luxation* or Diſlocation?

A. This is diſtinguiſhed into *perfect*, and *imperfect*; the latter call'd a *Subluxation*: the firſt is, when the moveable Head of any Bone is diſplaced from its Articulation, ſo as to impede and deſtroy the Motion and Office of the Part; but the latter is, when the Ligaments only are ſtrained, the Bone either ſlipping again into its place, or remaining but a little diſtorted. The *perfect* Luxations happen chiefly in Bones articulated by Diarthroſis, having a manifeſt and ample Motion, as in thoſe of the upper and lower Extremities; but the *Subluxation* is more peculiar to the Synarthroſis, where there is little or no Motion, as in the Bones of the Carpus, Tarſus, *&c.*

Q. 158. How do you diſcover a *perfect* Luxation?

A. (1.) From an Immobility and Disfiguration of the Limb, which appears diſtorted, and longer or ſhorter than it ought to be. (2.) From an Excavation upon the Joint, and a Tumor where the Head of the Bone is thruſt, the lower Head of the Bone appearing diſtorted in an oppoſite direction to the upper Head. (3.) By feeling with the fingers, and enquiring into the Patient's Account of the Accident, with the Severity of the Symptoms, and a Knowledge of the Articulation.

Q. 159. What are the principal *Cauſes* of Luxations?

A. Theſe may be either external or internal, or both concurring together. Under the former are included Falls, Blows, Strainings, *&c.* the internal are a Laxity and Weakneſs of the Ligaments, and a Tumor of the mucilaginous Glands, or a Congeſtion of Humours in the Cavity of the Joint; but when the Diſlocation proceeds from theſe laſt Cauſes alone, the Joint is uſually free from Pain, Inflammation or Tumor, and the Head of the Bone may eaſily be ſlipped into and out of its Cavity.

Q. 160. What are your curative Intentions for a Luxation in general?

A. They are (1.) to extend the Limb, ſo that the Head of the Bone may be free from Obſtacles on any ſide; (2.) by reducing the Head of the Bone into its proper Situation, which follows almoſt ſpontaneouſly, uſually with a noiſe when the Limb is duly extended in a proper direction, eſpecially if there is the leaſt aſſiſtance given to it by the hands; (3.) to retain the Bone by ſuitable Deligation, till the Ligaments have recovered their due Tone, keeping the Limb and Body in a juſt Poſture. But theſe Means are to be varied according to the particular Nature of the Joint luxated. —For Cautions here conſult thoſe mention'd before for Fractures (Q. 156.)

Q. 161. How do you diſcover and cure a Luxation of the Head?

A. A Diſlocation of the Head in its Articulation with the *Atlas* or uppermoſt Vertebra, readily diſcovers itſelf by the Diſtortion of the Chin thence following, either forward, or to one ſide; but this, as it compreſſes the Medulla oblongata paſſing from the Brain and Cerebellum, is conſtantly attended with ſudden Death, unleſs ſome Perſon in the very Inſtant lifts the Patient up by the Head from the ground, or otherwiſe makes a Reduction by extending the Neck. Thus the chondyloide Proceſſes of the Occiput may eaſily ſlip out of their glenoide Cavities in the firſt Vertebra of the Neck, by a Fall from a Horſe, or from any high Place, in which Caſe the Chin is uſually diſtorted cloſe down to the Breaſt; and as this Luxation without immediate Aſſiſtance brings ſudden Death, it is commonly called a breaking of the Neck, but more properly a Diſlocation of it.

Q. 162. How do you treat Luxations of the Spina dorſi?

A. The Vertebræ of the Spine are ſo ſtrongly articulated together by robuſt Ligaments and Cartilages, with oblique aſcending and deſcending Proceſſes locking one into another, that they cannot well be diſlocated without a Fracture of the Proceſſes; in conſequence of which the ſpinal Medulla being wounded or compreſſed, a Palſy of all the Parts below the Injury muſt follow, the Urine and Fæces come away involuntarily, and a Diſtortion appears in the Spine either backward or to one ſide, where the Luxation is made. The Caſe is more fatal, as the Injury is nearer the Head; and though moſt Patients miſcarry rather from the Injury of the contained Medulla, than the difficulty of reducing the Bones (which is not ſmall); yet trial ought to be made whether any Relief can be afforded by Art. The Spine is therefore to be extended by inclining the Patient over a Caſk, or other cylindric Body, which naturally reſtores the Vertebræ to their proper Situations, provided, if the Diſorder is lateral, that the Patient is inclined in this Poſture towards the other ſide; and then the fractured or diſlocated Proceſſes may be reſtored by the Fingers, After applying a Compreſs dipped in *ſp. vin. camph.* retained by the Napkin and ſcapulary Bandage (*Q.* 147.) the Patient is to be bled, treated with proper Medicines, and retained in a convenient Poſture in his Bed.

Q. 163. How do you treat a Luxation of the *naſal Bones?*

A. Theſe may indeed be beat flat, by a Blow or ſome other Violence, in Children, but hardly without a Fracture in Adults; and in either Caſe they are to be raiſed again by a Gooſe-quill, or ſome other ſuch cylindric Inſtrument, replacing them in the mean time by the Fingers applied externally, and compleating the Dreſſing with a bit of ſticking Plaſter, retained by the naſal Sling, *Fig.* 7. *Tab.* S. applied with its Aperture *a* tranſmitting the Apex of the Noſe; I then carry its two upper Heads *b b*, obliquely downward behind the Occiput, where being croſſed they are then tied upon the Forehead *c c*, by the knot *d*; then the lower Heads *e e* are carried obliquely upward over the Cheeks and Temples *f*, croſſed upon the Occiput, and tied on the Forehead *g g*. Some indeed introduce a Pewter Canula into each Noſtril, and apply Splints externally, which is ſeldom neceſſary.

Q. 164. How do you treat a Diſlocation of the *Jaw?*

A. Notwithſtanding the firm and artful Articulation of this Bone, it has ſometimes either one or both of its round Heads thruſt out of the glenoide Cavities of the Os petroſum, into which they are articulated, and this either by yawning, or ſome other Violence. If both Heads are luxated, the Mouth gapes wide open, the Chin is thruſt down to the Breaſt, and the Patient can hardly ſpeak or ſwallow at all; but if only one Head is diſlocated, the Chin inclines towards the oppoſite ſide. In either Caſe, the Patient being ſeated on the Floor, and held by an Aſſiſtant, I introduce my two Thumbs wrapped in a clean Napkin, as far as poſſible, into the Patient's Mouth, while my Fingers come under the ſides of the Jaw, which I thus preſs downward and backward, but moſtly towards the injured ſide, when only one head of the Jaw is diſplaced; which is rarely the

Caſe. Then applying a Compreſs dipped in Vinegar, *ſp. vin. camph.* I then uſe the Bridle or Sling with four Heads, (*Fig.* 7. *Tab.* S.) about an ell long, and five or ſix fingers breadth, and applying the Aperture to the Chin, the two upper Heads are croſſed upon the Occiput, and then tied upon the Forehead *c c* by the knot *d*, while the two lower Heads are carried up by the Cheeks *f*, and tied upon the Vertex *g*, or elſe carried down again and tied under the Chin.

Q. 165. How do you treat a Fracture of the *lower Jaw?*

A. I firſt apply my Forefinger of one Hand within the Jaw, and endeavour to replace the Fragments by thoſe of the other Hand without; and if any of the Teeth are ſtruck out, I replace them immediately, ſince they have been often obſerved to grow again: if there ſhould be any looſe fragments incapable of Reduction, I extract them as ſoon as poſſible, either by Inciſion, or as ſoon as a Suppuration will allow; and compleat my Dreſſing for the firſt time with a Compreſs dipped in *ſp. vini vel acet.* applied internally, while externally I adapt another Compreſs, moiſtened as before, and faſtened to a piece of ſtrong Paſtboard cut in the ſhape of a half Jaw; and this I repeat on the other ſide if neceſſary, and retain them by the Bridle before-mentioned in a Luxation (*Tab.* S. *fig.* 7.), obſerving to bleed and treat the Patient with a proper Regimen and Medicines, according to the Circumſtances of the Caſe.

Q. 166. How do you diſcover and treat a Luxation and a Fracture of the *Clavicle?*

A. This Bone hardly admits of a perfect Diſlocation, without breaking the Ligaments which connect it at each end to the Sternum, and to the Proceſſus Acromion Scapulæ; in either of which Places the diſlocated Head may be felt, the Patient not being able to lift up the Arm to his Head. But the Clavicle is much more liable to a Fracture, from its Weakneſs and tranſverſe Poſition; which when it happens may be eaſily diſcovered by the Fingers, as this Bone lies immediately under the Skin. After the Fragments are reduced, as in a Luxation of it, by ordering a ſtrong Man to pull back the Patient's Shoulders towards each other, againſt a narrow-backed Chair, or ſome other Support, while the Fingers conduct them properly before: and if the Fracture is not oblique, the two

Ends of the Bone will ſuſtain each other, if they are guarded with a Compreſs of Emplaſter rolled up with two Heads, as in *Tab.* II. *fig.* 2. O O P P. and applied on each ſide above and below the Bone. Over this is to be applied a Compreſs and piece of Paſteboard; then another Compreſs to be retained by the Capeline Bandage, *Fig.* 8. *Tab.* S. or by the ſimple Spica, *Fig.* 2. *Tab.* T. when the Fracture is next the Shoulder; which is to be kept extended by a Roller paſs'd ſeveral times round the two Shoulders, and croſſing upon the Back like a figure of 8.

Q. 167. How do you treat a Fracture of the *Scapula?*

A. This Bone is ſeldom broke but in its Acromion or Proceſs which meets the Clavicle; in which Caſe the ſtrong Contraction of the deltoide Muſcle makes it difficult to retain the Fragments ſo together, as to prevent the Callus from ſhooting out longer than it ought; whence the free Motion of the Arm upwards will be impeded after ſuch a Fracture: but in the mean time this muſt be remedied as much as poſſible, by keeping the Arm raiſed with a Ball fixed in the Axilla, a Compreſs above, and the whole retained by the ſpica Bandage, *Tab.* T. *fig.* 2. A Fracture in the Neck of the Scapula (which ſeldom happens) is extremely difficult to reduce, and often attended with the worſt Conſequences, from the Vicinity of the large Nerves, Blood-veſſels, Ligaments, *&c.*

Q. 168. How do you treat a Fracture or Depreſſion of the *Sternum?*

A. To raiſe or reduce the Fragments to their proper Situations, I lay the Patient with his Back leaning over a ſmall Caſk, or ſome other cylindric Body, and at the ſame time preſs the two ſides of the Thorax together with my Hands, while an Aſſiſtant thruſts down his Shoulders; and if this does not ſuffice, I make an Inciſion through the Integuments, and endeavour to raiſe up the Part by a Screw, as in a Depreſſion of the Skull; and if any conſiderable quantity of Blood ſhould be extravaſated betwixt the Duplicature of the Mediaſtinum, or into the Cavity of the Thorax, it muſt be diſcharged in the firſt Caſe by trepanning the Sternum, and in the laſt by the Paracenteſis, as before, to prevent an Empyema.

Q. 169. How do you treat a Luxation and Fracture of the *Ribs?*

A. Their Heads next the Spine may be diſplaced either upward, downward, or inward; the two firſt are more eaſily reduced, by raiſing up the Patient's Arm over a Door, Board, or the like, endeavouring to replace the Bone by the Fingers, while the Ribs are thus drawn aſunder: but the laſt is more difficultly reduced, by ordering the Patient to take a deep Inſpiration, while he is inclined forward over ſome cylindric Body; and if this with the Aſſiſtance of the Fingers will not ſuffice, the Bone may be left diſlocated, provided there are no violent Symptoms; otherwiſe an Inciſion muſt be made, to replace it by a Hook, or with the Fingers.—A ſimple Fracture of the Ribs is not dangerous; but when their Extremities ſtart either thro' the Pleura inward, or the common Integuments outward, the danger is conſiderable; eſpecially in the former, as the Conſequence may be a violent Fever, Pains, Extravaſation, Empyema, *&c.* If the Extremity of the fractured Rib projects outward, the Patient muſt be placed as above for a Luxation, and the Fragments gently preſſed into their Places by the Fingers; but when they point inward, the Patient muſt fetch a deep Inſpiration, and then the ſides of the Thorax muſt be ſhook and preſſed together by the Hands next the Sternum. After the Reduction of the firſt, Paſteboard Splints are ſecured upon the Fragments, to prevent their riſing outward; but in the latter there is no occaſion for them, only thick Compreſſes are to be ſecured along the Ends of the Ribs next the Sternum, and the Dreſſings retained by the Napkin and Scapulary before-mentioned (Q. 147.)

Q. 170. How do you treat a compound Fracture of the *Ribs*, with a Wound of the intercoſtal Arteries, Muſcles, *&c.*?

A. In the firſt place I endeavour to ſuppreſs the Hæmorrhage as ſoon as poſſible, by tying a piece of Linen rolled up into a Cylinder in the middle of a ſtrong waxed thread, one end of which being paſſed round the Rib by a Needle, I draw the Compreſs over the Sulcus in the lower edge of the Rib; and then by tying the thread hard round the Bone, by that means compreſs the intercoſtal Artery and Vein: and if any Splinters or irritating Fragments appear wounding the Pleura or adjacent Muſcles, I either replace them, or elſe extract them with or without Inciſion, as ſhall be found moſt convenient.

Q. 171. How do you treat Luxations and Fractures of the *Vertebræ?*

A. Theſe cannot be diſplaced without a Fracture of their interfering Proceſſes, and without the utmoſt hazard of the Patient's Life; becauſe the Medulla Spinalis being compreſſed or wounded, will produce a Palſy of the Parts below; whence it is evident, that theſe Luxations are no leſs dangerous than difficult to reduce: in order to which the Patient is to be laid, when the vertebral Proceſſes are diſplaced, on both Sides, inclined over a Caſk or other cylindric Body; but inclining more to the ſound Side, if they are diſplaced only on one Side, while in the mean time an Attempt is made by the Fingers to replace them; which done, a Compreſs is applied, dipped in ſome antiphlogiſtic Liquor, and then a Paſteboard Splint retained by the Napkin and Scapulary. But if any looſe Splinters injure the ſpinal Medulla and adjacent Parts, they muſt be removed by Inciſion, if they cannot be replaced.

Q. 172. How do you treat a Fracture and Diſlocation of the *Os ſacrum* and *Coccyx?*

A. If the Os ſacrum ſhould appear to the Touch fractured by ſome Fall, Blow, or other Violence, the Fragments are to be replaced by the Fingers applied externally, when they point outward; or if they point inward, by introducing the Finger into the Anus; and after the Reduction, Compreſſes are to be retained upon the Part by the T Bandage, and the Patient is to lie on one ſide or the other alternately; or if he ſits, it muſt be in a Chair with a hole in the bottom, to prevent any diſplacing of the Fragments by Preſſure. A Fracture or Diſlocation of the Os cocygis is to be treated in the ſame manner.

Q. 173. How do you treat a Diſlocation of the *Femur?*

A. The round Head of this Bone is ſo ſtrongly articulated into the deep Acetabulum by the round and capſular Ligaments, ſecured by very thick incumbent Muſcles, that it is almoſt impoſſible for it to be diſlocated by any Force, without a previous Relaxation, or a Tumor of the mucilaginous Gland lodged in the Cavity; from whence, and from the Friability of the Neck of the Femur, as alſo from innumerable Diſſections of Bodies thus affected, it is evident that the Femur happens to be fractured in its Neck nineteen times to one Diſlocation; ſo that what is commonly taken for a Diſlocation of the Femur, is in reality a Fracture of its oblique Neck. Yet it muſt not be denied, that in weak, cachectic and ſcorbutic People, and in Infants or Children, the Femur may by ſome Violence be diſlocated, and that moſt commonly downward, and inward or forward towards the Opening in the Os pubis; in which Caſe the Knee and Foot ſtraddle outward and backward, the diſeaſed appearing longer than the ſound Leg; the Head of the Bone is alſo perceptible below the Inguen; where by compreſſing the Nerves of the Bladder, it ſometimes cauſes a Suppreſſion of Urine, and a withering of the whole Limb from the ſame Preſſure on the crural Nerve, if the Bone is not ſpeedily reduced; as muſt be attempted by making a moderate Extenſion, either by the Polyſpaſton, *Fig.* 4. *Tab.* I. or by the Axis in Peritrochio, *Fig.* 3. *Tab.* K. while the Patient's Body is properly ſecured; and then by turning the Knee and Thigh inward, the Head of the Femur is to be directed by the Hand into the Acetabulum.—But it may be alſo diſplaced upward and backward, when the Limb will be ſhorter, the Foot will turn inward, the Heel will be raiſed from off the Ground, and the Limb will be more capable of Flexion than Extenſion. It is obſervable, that a Diſlocation or a Fracture of this kind is commonly attended with a waſting of the Limb, from the more or leſs Injury offered to the crural Nerve.

Q. 174. How do you diſtinguiſh a Fracture from a Luxation of the *Femur?*

A. The Knowledge of this is no leſs difficult than the Cure, as the Joint is covered with ſuch ſtrong and thick Muſcles, which reſiſt an Extenſion and Reduction; and the latter eſpecially is oppoſed by the Synovia, inſpiſſated in a great quantity, if the Bone has been out any time: however, if I find the Limb may be turned about without any grating of the Bones at the Joint; and if the Symptoms of Pain, Inflammation, Tumor, *&c.* are ſlight or nothing conſiderable, I conclude there is no Fracture; which is indeed difficult enough to diſcover in fat People, but is more difficult to cure without a Halting or Shortneſs of the Limb; partly becauſe the Fragments cannot be eaſily replaced by the Fingers, as they are covered with ſuch thick Muſcles; partly from the difficulty of retaining

ing them from being diſplaced by the ſtrong contracting Muſcles; and partly from the oblique Direction of the Neck of the Femur. If then the Neck of the Femur appears to be fractured from the grating of the Bones, the Acuteneſs of the Pain felt above the Articulation upon ſetting the Foot to the ground, and the Shortneſs of the Limb, a violent Extenſion muſt here be carefully avoided, that the Fragments of the Bone may not be diſtracted from each other to the great Injury of the ſoft Parts; only ſuch an Extenſion muſt be made, as will ſuffice to bring the Fragments even with each other, and to make both Limbs appear of an equal Length. The Fragments are to be retained together by a ſtrict Bandage, the Spica inguinalis, (*Tab.* T. *fig.* 3.); and then the Limb may be kept extended at its due Length by the Axis in Peritrochio, (*Fig.* 3. *Tab.* K.) while the Patient's Body is retained firm by Napkins faſtened to the Head of the Bed.

Q. 175. How do you treat Fractures in the Body of the *Femur?*

A. A ſimple tranſverſe Fracture is the moſt eaſy to cure, as the Bones then ſuſtain each other, and reſiſt the Contraction of the

Muſcles; but an oblique Fracture is hardly curable without ſome Inequality of the Callus, or ſhortening of the Bone, unleſs the Limb is kept extended by the Apparatus deſcribed *Tab.* K. *fig.* 3. So ſoon therefore as the Fragments are replaced, I apply Compreſſes dipped in Vinegar, and make them preſs upon the Part by the ſpiral inverted Bandage applied moderately light; then I apply three Splints of ſlit Deal glued upon Leather; and laſtly, a large Splint extending from the Hip to the Ancle to keep the Limb ſtrait. But in a compound Fracture, where there are looſe Fragments, and a Wound externally, the Caſe is very dangerous, from the Injury offered to the adjacent Nerves and Blood-veſſels; whence violent Inflammation, Suppuration, Fever, Convulſions, *&c.* and as the Wound will require frequent Inſpection, and a particular Treatment, with Cataplaſms, Fomentations, *&c.* it will be here neceſſary to apply the foliated Bandage with eighteen Leaves, *Tab.* K. *fig.* 1. as in a compound Fracture of the Leg. If any conſiderable Ecchymoſis appears, Inciſions are to be made, that the Blood may diſcharge itſelf; then fomenting the Parts with an Infuſion of *Theriac. in ſp. vin. camph. cum aq. calcis p. e.*

Q. 176. How do you treat a Luxation and Fracture of the *Patella?*

A. The Patella ſeldom ſuffers a perfect Luxation, unleſs the Knee is diſlocated at the ſame time, or unleſs the ſtrong Ligaments are broke, which would otherwiſe reſtore it again to its proper place. When it is diſplaced, it muſt be on the out or inſide of the Joint, ſince it cannot be thruſt up above without a Rupture of its connecting ligamentary Aponeuroſis at the Tibia, which is a Caſe frequently miſtaken for a Fracture of the Patella, when in reality the whole Bone is contracted upward by the Muſcles of the Thigh, while a Portion of its tendinous Ligament remains below adhering to the Tibia, and feels like a tranſverſe Fragment of the Bone, as Mr. *Deverell* obſerves, *Phil. Tranſ.* N° 365. *p.* 44. nor is it difficult to replace this Bone when diſlocated. — A Fracture of the Patella may be either longitudinal or tranſverſe, the laſt of which is the moſt frequent and difficult to reduce: but a compound Fracture, when this Bone is ſhattered, is ſtill worſe, and much endangers the Stiffneſs of the Joint, from a Luxuriancy of the Callus into the Articulation, which is the chief Accident we have to guard againſt in this Caſe, and which may alſo in part proceed from an Inſpiſſation of the Synovia, ſince the Limb is obliged to be kept a long time extended. A longitudinal Fracture of the Patella is eaſily reduced, and as eaſily retained by the uniting Bandage with ſuitable Compreſſes, namely, a double-headed Roller, as in *Fig.* 11. *Tab.* S. placed on each ſide; but in a tranſverſe or compound Fracture, after a careful Reduction, and the Application of a Plaſter, or a Compreſs dipped in ſome antiphlogiſtic Liquor, a double-headed Roller is taken of about three ells long, and three fingers broad, applying the middle immediately above the Patella *a*, *Fig.* 10. *Tab.* S. from which deſcending with a circular round *d*, the Roller heads are croſſed in the Ham, thence brought forward and croſſed below the Knee, then carried back, croſſed again in the Ham, and the ſame Courſe repeated as before, like a figure of 8, as long as the Roller laſts; and then the Leg is to be kept extended by Splints, or a wooden Box.

Q. 177. How do you treat a Diſlocation of the *Knee?*

A. This is when the Tibia ſlips from under the Head of the Femur, either on one ſide or backward; but hardly ever forward, from the Reſiſtance of the Patella with its ſtrong Tendons: for ſo firm is the whole Articulation, that a perfect Luxation ſeems hardly practicable without a Rupture of the Ligaments. There is no difficulty in reducing this Joint after a due Extenſion, unleſs the Ligaments are broke, which may be attended with moſt excrutiating Pains, Convulſions, *&c.* if not timely relieved: but in both Caſes great Care muſt be taken to prevent a ſtiff Joint, by giving it a little Motion every day. The ſame Bandage with Paſteboard Splints will ſuffice here, as for a Fracture of the Patella (*Q.* 176.)

Q. 178. How do you treat a Luxation of the *Fibula?*

A. As this is ſometimes ſeparated from the Tibia, and diſtorted either upward or downward, when the Foot has been luxated outward; it will be proper in this Caſe to adjuſt its Situation, and retain it by a Bandage and Compreſs moiſtened with *acet. & ſp. vini camph.* till the Ligaments have recovered their due Strength.

Q. 179. How do you treat a Fracture of the *Leg*?

A. If the Fibula only is fractured, there is ſeldom occaſion either for Extenſion or Reduction; and a Fracture of the Tibia readily manifeſts itſelf from the Nakedneſs of that Bone, which alſo gives a better Opportunity of adjuſting the Fragments, if they point outward. To diſcover the Nature of the Fracture, I graſp the Calf of the Leg with one Hand, and cautiouſly move the Foot about with the other, ſo as to feel the Motion of the Bones by the Hand on the Leg. If the Fracture be compounded or complicated with a Wound, Splinters, Contuſion, *&c.* I remove the Fragments or other foreign Bodies, ſuppreſs the Hæmorrhage and Inflammation, replace the Bones, and dreſs up the Limb with convenient Topicals and a foliated Bandage, *Fig.* 1. *Tab.* K. and finally, the Leg is to be retained in a wooden Box for the purpoſe, *Tab.* L. *fig.* 12. in which the former repreſents the whole put together, as the latter repreſents the ſeveral Parts aſunder. In *Fig.* 1. *a* repreſents the Foot-board, which together with the Side-boards *f g*, are let down by the Hinges marked *d d* in *Fig.* 2. But when the bottom of the Machine *a a* is placed under the fractured Leg, the Foot-boards and Side-boards are drawn up and faſtened by the Hooks *e e*. *f f*, *Fig.* 2. repreſent the Baſis of the Machine, which is raiſed higher or lower by means of the Pedeſtal *h* moving in the Notches *b b*; *g g* denote the Hinges which join the Baſis and Bottom of the Machine together.—Over the Floor or Bottom of the Machine *a a* are nailed pieces of ſtrong Ticken, upon which the Limb may reſt with more Eaſe than upon the Board. The other Parts of this Machine compared with the entire Figure are ſufficiently obvious.

Q. 180. How do you treat a Diſlocation or Fracture of the Bones of the *Foot?*

A. The Foot is ſometimes diſlocated either outward or inward, forward or backward, by jumping or other violence, as may be readily perceived by the Diſtortion and Poſture of the Joint, the Foot inclining in an oppoſite Direction to the Diſlocation; but a Diſlocation of the Ancle outward can hardly happen without breaking the lower Head of the Fibula, or tearing it from the Tibia, which is often attended with the moſt violent Inflammation, Pain, &c. even though there be no real Luxation; and therefore to attempt a Reduction would be here highly miſchievous. If the Caſe is only a violent Strain or Laceration of the Ligaments without a Luxation, it will be convenient to bathe the Parts with *acetum Lithargyritum*, and put the Foot frequently in cold Water: but if the Ancle is diſlocated, an Extenſion muſt be made by two Aſſiſtants, one taking hold of the Inſtep and Heel, while the other holds the Patient's Knee, and then the Aſtragalus with the lower Head of the Fibula are to be replaced by the Fingers, retaining the Compreſſes and Splints, when neceſſary, by the tarſal Bandage, *Tab.* S. *fig.* 1. E. made with a ſingle or double-headed Roller, faſtened firſt round the Ancle, then carried round the Inſtep, interſecting each other in the bending of the Inſtep like a figure of 8 about the Foot and Ancle.

Q. 181. How do you treat a Fracture or Luxation in the Bones of the *Tarſus*, *Metarſus*, and *Toes?*

A. Theſe from the Number and Vicinity of the Nerves, Tendons, *&c.* are often attended with violent Symptoms, and no ſmall Danger; but, like other Bones, a Reduction of them is not likely to be accompliſhed without a perfect Knowledge of their Articulations and Poſitions with reſpect to each other; whence it is evident, that a ſtrict Examination of the Joints, furniſhed each with their reſpective Cartilages, Ligaments, Glands, *&c.* as they appear in a recent natural Skeleton, is an Article of the higheſt Importance in Surgery. After the Reduction, the Splints and Compreſſes are to be retained with the Bandage laſt mentioned.

Q. 182. How do you treat a Luxation or Fracture in the Bones of the *Fingers?*

A. By a gentle Extenſion and Reduction as in others, retaining the Compreſſes and Splints by the glove Bandage, *Fig.* 6. *Tab.* T. when the Diſorder extends to ſeveral of the Fingers: but in compound Fractures of the Fingers with a Wound, I dreſs each of them apart with little foliated Bandages like that for the Leg, *Fig.* 1. *Tab.* K.

Q. 183. How do you treat Fractures and Luxations in the *metacarpal* or *carpal Bones?*

A. By extending them flat upon a Board or Table, as in thoſe of the Tarſus and Metatarſus, and then reducing them by preſſing with my Hands and Fingers: after the Bandage, I keep the Hand and Carpus extended betwixt two pieces of Paſteboard lined with ſoft Compreſſes.

Q. 184. How do you treat a Luxation of the Hand in the Joint of the *Wriſt?*

A. This, like the Ancle, may be diſlocated four ways; but more eaſily forward or backward than laterally, becauſe the Carpus is guarded on each ſide by the Heads of the Radius and Ulna. The Reduction is made by extending the Hand over a Table, replacing the Bones by preſſing with the Fingers, and retaining with Compreſs, Splints and Bandage.

Q. 185. How do you treat a Fracture in the *Cubitus?*

A. As the Cubitus or lower Arm contains two Bones, the Radius and Ulna, the former of which has a free rotatory Motion without being connected like the other to the Humerus, it is evident that a Fracture may happen either in one or both of theſe Bones. If one Bone is ſound, it proves a better Support than either Splints or Bandage; but when the Fracture happens in the lower Part, it is ſtrongly ly drawn aſide by the adjacent pronator quadratus Muſcle towards the ſound Bone, which with the other Circumſtances of this Fracture may be readily perceived by feeling and moving the Bones with diſcretion. If a Fragment of the Radius is contracted towards the Ulna, I order an Aſſiſtant to hold the Arm, and incline the Patient's Hand towards the Ulna, to draw back the contracted Part of the Radius; which being reſtored, together with the quadratus Muſcle, to a due Situation, I retain them by the Application of convenient Compreſſes, Splints and Bandage: but in ſetting a Fracture of the Ulna, I incline its Head towards the Thumb, and proceed as before. If both Bones are broke, a convenient Extenſion is to be made, when neceſſary, in a right Line, reducing and retaining the Fragments as before.

Q. 186. How do you treat a Diſlocation of the *Elbow?*

A. In this Joint the Head of the Humerus and Ulna are articulated mutually into each other like a Hinge, which is termed *Ginglymus*; ſo that it is very difficult for a perfect Luxation to happen here, without the Olecranon (or Head of the Ulna, called the Elbow, analogous to the Patella) ſhould chance to be broken off. If the Cubitus be luxated backward and upward, which is moſt frequently the Caſe, (it being more difficult for it to recede laterally, and impoſſible forward, without a Fracture of the Olecranon) the Arm becomes ſhorter, cannot be extended, and is accompanied with the moſt ſevere Pains, Inflammation, *&c.* from the Diſtraction of the Ligaments and Tendons, which if not timely relieved may produce Convulſions, Vomiting, Fever, Gangrene, and Death: nor is it eaſy to replace this Bone, if it has continued any time out; though this muſt be endeavoured by a pretty ſtrong Extenſion made by two Aſſiſtants, till one can feel the Bones at liberty in the Joint to be replaced. After the Reduction, the Inflammation muſt be taken off by bleeding and fomenting, cooling Purges, *&c.* ſecuring the Joint with Compreſſes dipped in *ſp. vini camph. vel acet.* and retaining them by a moderate Bandage applied as for bleeding in the Arm, *Tab.* S. *fig.* 1. D.; which is to be afterwards ſuſpended in a Napkin or Sling hung about the Neck, *Tab.* M. *fig.* 7.

Q. 187. How do you treat a Fracture of the *Humerus?* *A.*

A. A Fracture near the upper or lower Head of this Bone, is much more dangerous than in its middle, as the large Blood-veſſels and Nerves lie near; and an oblique Fracture in a ſtrong muſcular Patient, is very apt to contract or ſhorten the Limb by the Ends of the Bone riding the one over the other; whereas they ſuſtain each other, when the Fracture is tranſverſe. In order for the Reduction, the Arm is firſt to be extended by two Aſſiſtants, one holding the Patient's Shoulder above the Fracture, and the other (taking hold of the Arm below the Fracture, with the Elbow a little bent) continues to extend it gently forward in a right Line, while the Fragments are in the mean time reduced to their proper Situations by a judicious Application of the Hands and Fingers; and laſtly, after the Application of a Roller dipped in Vinegar, the Arm is ſecured with three Splints and Compreſſes, as at *Tab.* M. *Fig.* 7. *a a* tied over the Bandage by the Strings *b b b*, making the knots on the outſide of the Arm, which is ſuſpended by a Sling or Napkin about the Neck *c c c* tied in a knot upon the Shoulder *d*, and ſuſtaining the Paſteboard Caſe *e* when the Fracture is in the Cubitus, this laſt being unneceſſary in a Fracture of the Humerus. *Q.* 188.

Q. 188. How do you treat a Luxation of the *Humerus?*

A. This Joint from the Length and Laxity of its Ligaments, with the Largeneſs of its Motion, and the Shallowneſs of the Cavity in the Scapula, is extremely liable to Diſlocation; in which the round Head of the Humerus may be diſplaced either forward, backward, or obliquely downward in the Armpit, or even below the Scapula, but ſeldom perpendicularly downward, and never upward without a Fracture of the Acromion and coracoide Proceſs of the Scapula; to which add the Reſiſtance of the ſtrong deltoide and bicipital Muſcle. The diſplaced Head of the Bone may, for the moſt part, be readily perceived by the Fingers applied to the Axilla; and if it is found forward and downward, it will be apt to compreſs the axillary Nerves and Blood-veſſels, whence a Numbneſs of the Fingers and Arm, with a Palſy, *&c.* may follow. Here therefore it will be neceſſary to make an Extenſion as ſoon as poſſible, keeping the arm in a right Line, while the Head of the Humerus is agitated one way or the other, ſo as to direct it by the Hands towards the Cavity in the Scapula. If the Hands alone are not ſufficient for this purpoſe, it may be convenient to make uſe of the Machines, *Tab.* I and K. The Bandage here is the ſimple Spica, *Tab.*T.*fig.* 2.

Q. 189. In what Caſe is the Amputation of a Limb neceſſary?

A. Chiefly to prevent a ſpreading Mortification from invading the whole Body, and from deſtroying the Patient, as it often otherwiſe would, when the Muſcles or Bones of a Part are violently ſhattered, invaded with a Gangrene, Caries or Spina ventoſa, or when the brachial, crural, or other large Artery or Nerve is divided, or obliged to be intercepted by Ligature, *&c.* ſo as to cauſe a Mortification.

Q. 190. How do you *amputate* a Finger or Toe?

A. Theſe are frequently taken off by cutting Pincers, or by a ſharp Chiſſel; but it ſeems in my Judgment much the eaſieſt and better way, in theſe ſmall Members, to divide in the next ſound Joint with a Scalpel, drawing up and leaving a ſufficient Portion of the Skin to cover the Stump, and expedite the Cure; and by this means one is ſure to avoid a ſupervening Caries, or a ſplintering of the Bone, to which the former Methods are liable. After Amputation I dreſs with ſcraped Lint, Compreſs and Bandage. The Hæmorrhage will ceaſe by the Application of *Alcohol vini*, if it ſhould prove exceſſive; and afterwards I dreſs with ſome vulnerary Balſam ſpread on a Pledget of ſoft Lint, retained by a ſticking Plaſter and Compreſs cut in ſhape of a *Malta* Croſs, or elſe with two long Slips of Plaſter laid acroſs each other over the Stump, then a Compreſs and a circular Bandage.

Q. 191. How do you *amputate* the Hand?

A. This I amputate at leaſt one or two finger's breadth above the Mortification or Caries, never in the Joint itſelf in theſe larger Amputations, becauſe of the difficulty of healing the Stump. Having therefore marked the Place, and diſpoſed my Apparatus in order, I place three Aſſiſtants round the Patient, as in *Tab.* Q. *Fig.* 1. ordering the Aſſiſtant *d* to draw up the Skin tight, and then proceed to apply a piece of Tape about an ell long circularly round the Limb, the better to guide the Inciſion, which I next proceed to make (having firſt ſecured the Artery in the Arm above by the Tourniquet, *Tab.* S. *fig.* 1. K. which is to be taken care of by the Aſſiſtant *d*) with the Scalpel, *Fig.* 1. *Tab.* O. Having divided the Skin, I order the Aſſiſtant *d* to draw it up as much as poſſible, and then proceed to cut through the Fleſh to the Bones circularly, and cloſe to the edge of the retracted Skin, with the large crooked Knife, *Tab.* O. *fig.* 2. and then I divide the intermediate Fleſh and Ligament betwixt the Bones by the double-edged Catlin, *Tab.* O. *fig.* 3. with which I alſo ſeparate the Perioſteum a little both from the Radius and Ulna, to prevent its being lacerated by the Teeth of the Saw, *Tab.* O. *fig.* 4. which I next apply on the outer ſide of the Arm, as in *Tab.* Q. *fig.* 1. *b*, ordering the Aſſiſtant *d* at the ſame time to draw up the Fleſh as much as poſſible, to open a Paſſage to the Bones, that they may be cut off a little higher than the Inciſion, and that the Fleſh may afterwards wrap over them; to do which the more effectually, the Fleſh may be drawn up from the Bones by a piece of Linnen with a ſlit in it, the two ends of which may be pulled up by the Aſſiſtant *d*; and thus the Fleſh and Skin being longer than the Bone, and folding over the Stump, will greatly haſten the Cure. I now continue to work the Saw upon both Bones after they have been gently entered by the Teeth, with which I cut through them in leſs than a minute, being careful to have both Bones divided at the ſame time without ſplintering them. The Limb being thus off, I order the Aſſiſtant *d* to relax a little the Tourniquet, that by the ſtarting forth of the Blood I may diſcover the Ends of the Arteries, which I then ſecure by Ligature with a crooked Needle and waxed thread, which ſhould be pretty broad to prevent it from cutting through the Coats of the Artery, which I thus intercept, together with the circumjacent muſcular Fleſh, by paſſing the Needle twice round, and ſecuring the Ligature by the Surgeon's Knot, at the ſame time carefully avoiding to intercept any adjacent Nerve by the Ligature, which might occaſion Convulſions and the worſt Symptoms. Some indeed not only tie up a Portion of the circumjacent muſcular Fleſh together with the Artery, but paſs the Needle tranſverſly through the ſaid Fleſh and end of the Veſſel, in order to prevent the Ligature from ſlipping off, or cutting through the arterial Coats; but in moſt Caſes the firſt Method will ſuffice. The Method by the Pliers and Ligature only, *Tab.* Q. *fig.* 2. is apt to let the Artery ſlip through. In the next place I apply to the end of the Stump ſome Doſſils of dry Lint, charged with a fine abſorbent or ſtyptic Powder of Bole, Starch, black Roſin finely levigated, *&c.* to which add the *Fungus pulverulentus*, or Puff-ball cut into ſlices; though in reality fine dry Lint will anſwer the Intention equally as well, or rather better, as it leaves the Surface of the Wound cleaner; obſerving to lay on the Lint unequally, according to the Situation of the Parts; thickeſt upon the Veſſels which diſcharge moſt, and then ſecuring the whole with an oiled Bladder, it is retained moderately firm upon the Stump with Compreſs and Bandage, rather lax than too tight. Then the Patient is bled, if neceſſary, and diſpoſed to reſt; and if the Dreſſings ſit eaſy, they are not to be removed before the third or fourth day, unleſs ſevere Pain, Inflammation, Hæmorrhage, *&c.* ſhould make it neceſſary; nor even then ſhould the Portions of Lint be taken off, unleſs they are in a manner ready to drop off ſpontaneouſly without any Adheſion; abſorbing the Matter by the gentle application of dry Lint, and not by a rough wiping the Surface. The next Dreſſing may be made either with dry Lint, or a Pledget ſpread with ſome digeſtive Ointment,

ment, retained upon the Stump by ſix long ſlips of Emplaſter, croſſed over each other like a Star, and then the Bandage applied tight enough to retain the Dreſſings, but not to cauſe any Uneaſineſs; for provided the Dreſſings are kept on, as the Arteries are ſecured by Ligature, no matter how looſe the Bandage. In the mean time the Patient muſt be kept under a proper Regimen, as in other great Wounds (*Q.* 145.), handling the Stump tenderly for fear of a freſh Hæmorrhage.

Q. 192. When and how do you procure an Exfoliation of the Bone in the Stump?

A. This is only neceſſary when the End of the Bone has been ſo much injured, or ſo long expoſed to the Air, as to deſtroy the Veſſels in its Surface; but if Care be taken immediately after the Amputation to exclude the Air by applying a ſmall Doſſil of Lint, dipped in *Fryer*'s Balſam, or in Tincture of Maſtic, to the End of the Bone, the Stump may be cicatrized without any Exfoliation of the Bone, if the Fleſh and Skin ſaved are gradually brought over it by rolling the Limb, but not ſo tight as to give uneaſineſs.

Q. 193. How do you amputate the *Humerus* above the Elbow?

A. Much in the ſame manner, and with the ſame Precautions as in the Cubitus, only with greater Circumſpection and Care afterwards, as this is attended with more Danger; and obſerving here, as before (*Q.* 191.) to ſave as much of the Limb as poſſible.

Q. 194. When and how do you amputate the Arm in its Articulation with the Scapula?

A. This is never performed but when a Mortification has extended to the Joint, or when the Head of the Humerus is ſhattered or carious; and the Inſtances thereof are very rare in Practice. We have an Account of it as performed by *Le Dran*, *Obſ.* 43. and by *La Motte*, *Traite complet de Chirurgie*, *Tom.* 3. *p.* 423. and it was performed with Succeſs at *Paris*, *Sept.* 24. 1730. by M. *Du Verney*, in the Preſence of Dr. *Boerhaave*. The Patient's Arm being extended, he firſt made a ſtrong Ligature upon the great Artery, by paſſing a Needle round it under the Axilla to prevent a Hæmorrhage; and then divided the Fleſh (the pectoral and deltoide Muſcle)

Muſcle) and Skin by a ſemicircular Inciſion, leaving enough to cover the Amputation; afterwards he divided the Ligaments and Capſule, which connect the Head of the Humerus to the Scapula. But great Care muſt be taken that the Artery is well ſecured by Ligature, and to avoid wounding it in the Amputation; which being compleated, the Artery is then to be ſearched for and ſecured by another Ligature above the former upon the Veſſel only, by paſſing a ſmall crooked Needle, armed with a pretty broad waxed thread round it, and then the firſt Ligature which intercepted the Fleſh, together with the Veſſel, may be removed to prevent Inflammation. Then the Fleſh and Skin are to be brought together to cloſe up the Sinus of the Wound, which is to be filled with dry Lint retained by a ſticking Plaſter in ſhape of a *Malta* Croſs, with Compreſs and the ſpica Bandage, *Tab.* T. *fig.* 2. In caſe of a ſpreading Mortification after this Operation, Bounds muſt be preſcribed to the ſpreading Diſorder by the application of a Pencil-bruſh dipped in a Solution of Mercury in Aqua fortis; and this with a proper uſe of the Bark internally, may procure a Separation of the dead from the living Parts, which when reduced to the State of a clean Wound may be healed in the ſame manner. Such an Amputation was accidentally made in *Auguſt* 1737, in the Arm of a poor Miller torn off. See *Phil. Tranſ.* N° 449. p. 313.

Q. 195. How do you amputate the Foot?

A. Here, contrary to an Amputation of the Cubitus, the Leg muſt be taken off a little below the Knee, even though the Diſorder extends no farther than the Foot, to avoid a long and uſeleſs Stump, which can be only an Incumbrance and Deformity to the Patient; whereas the Cubitus is to be amputated as low as poſſible, ſince the Stump may be uſeful upon many occaſions, and may be better adapted to an artificial Hand; but after a loſs of the Foot, a long Stump cannot be commodiouſly adapted to a wooden Leg, which muſt be faſtened to the Knee. I proceed in the Amputation in the ſame manner as before-mentioned in the Cubitus, applying the Tourniquet firſt to the Thigh, in the manner repreſented *Fig.* 1 and 6. *Tab.* R. finiſhing the Operation as before (*Q.* 191.) by ſtanding within-ſide the Leg, *Tab.* R. *fig.* 1. *b.*

Q. 196. How do you amputate the Thigh?

A. This muſt be done within two fingers breadth of the Patella, or elſe as low as poſſible, being very careful to give the Artery a due Compreſſure by the Screw Tourniquet, or by that made with a Ligature and the Turnſtick, as repreſented *Fig.* 1. LM. *Tab.* S. for as the femoral Artery is extremely large, an Error in this reſpect may occaſion a fatal Hæmorrhage in a minute's time. After the Amputation, as before directed, the femoral Artery is to be well ſecured by a Ligature, without intercepting the Nerve; and Ligatures muſt be likewiſe made upon the other ſmaller Arteries, which bleed conſiderably: the quantity of Lint here applied muſt be greater than in other Amputations, the other Dreſſings muſt be proportionably larger, and a long Compreſs muſt be ſecured by the Bandage upon the crural Artery by a Roller carried down the Thigh, or elſe the Tourniquet muſt be kept upon the Limb to abate its Impulſe, and prevent a freſh Hæmorrhage; and the Dreſſings are to be retained either by the capeline Bandage, *Tab.* E. *fig.* 14. or the Hands of an Aſſiſtant upon the End of the Stump; which laſt is moſt adviſable, eſpecially for the firſt day or two, obſerving to treat the Patient with a proper Regimen and Medicines, as in other great Wounds (*Q.* 145.) If the End of the Bone ſhould be carious, as not unfrequently happens, it muſt be pared away by the Scalpel till the ſound Bone appears; which will then readily unite with the Fleſh to compleat the Cicatrization, provided it be well guarded from the Air by a Pledget dipped in *Fryer*'s Balſam, or Tincture of Maſtic. It muſt be owned, that the profuſe Diſcharge of Matter which is often made from the Stump, greatly reduces, and often deſtroys a weak Patient; but this may be in a great meaſure remedied by the application of Lint dipped in *alcohol vini* ſaturated with *colophonium inguum*, or in *Fryer*'s Balſam, with a proper uſe of the Bark internally; taking care at the ſame time to keep the Skin and muſcular Parts from retracting and leaving the Bone, by the uſe of a moderate Bandage. If Opiates are found neceſſary, they muſt be uſed ſparingly and with great Caution, as they thin the Blood, and have been often obſerved to renew the Hæmorrhage.

Q. 197. What is *Phlebotomy*, and with what Precautions do you perform it?

A. This is an artful and careful Opening made in ſome of the more conſpicuous Veins by the common and well known Inſtrument a Lancet, (*Tab.* III. *fig.* 1.) chiefly in the Neck, Arm, Hand or Foot; being the moſt ancient, effectual and extenſive Remedy upon moſt occaſions with which we are acquainted, but requires Judgment in the Performance, to avoid the adjacent Nerves, Tendons or Arteries. To bleed in the Arm, after providing a Fillet, Compreſs, and a bit of Cerate Plaſter, *&c.* I ſingle out the Vein which preſents beſt, and apply the Ligature moderately tight above the Elbow by two circular rounds about the Arm, and with a ſlip-knot (*Tab.* II. *fig.* 4.); then chuſing out a Lancet either broad (*Tab.* III. *fig.* 1.) or ſpear-pointed (*ib. fig.* 3.) in proportion to the depth or riſing of the Vein, place it betwixt my Teeth with the Blade removed from the Handle, ſo as to form an obtuſe Angle, and in the mean time rub the Arm from the Hand upward, to make the Vein appear more conſpicuous; and then preſſing with my Finger to diſcover the Vicinity of the Artery, Nerve or Tendon, I make a ſmall Impreſſion with my Finger Nail upon the Skin where the Vein appears beſt for opening; I then place my left Thumb upon the Vein a little below the Impreſſion to keep it ſteady, and taking the Lancet betwixt my right Thumb and Fore-finger, reſting upon the other Fingers almoſt as one would hold a Pen, I plunge the Point into the Vein, ſo as to make an Orifice tolerably large by an oblique Inciſion carried upward by raiſing a little the Point, which I then inſtantly withdraw, and preſs my left Thumb upon the Orifice, till the Receptacle is ready to receive the Blood, which if obſtructed from flowing freely by too great Preſſure of the Ligature upon the Artery, I ſlacken it a little, and relax the Skin and Vein by bending the Arm in a ſmall degree, which is then to be ſupported by a Stick, which the Patient ſhould keep turning round. In this Operation one muſt obſerve, (1.) If there are many Cicatrices in the Skin from previous Bleedings, to open the Vein immediately below the laſt, if nothing forbids. (2.) That the Skin and the Vein be not diſtorted from their natural Situations in applying the Ligature, or by preſſing the Thumb at the time of Inciſion; otherwiſe the Orifice of the Skin and that of the Vein will not correſpond, which if it ſhould happen, they are to be aſſiſted by moving the Arm or Skin at diſcretion, or by enlarging the Orifice. (3.) That a tolerable large Orifice is always preferable to a ſmall one, as the laſt, eſpecially when the Inciſion is near a Valve, is commonly attended with a Thrombus or grumous Concretion, or elſe permits only the more fine and healthy Parts of the Blood to eſcape. (4.) That if the Vein lies deep, it muſt be opened by a Lancet with narrow Shoulders; but if it lies ſuperficial, it may be better opened by a Lancet with a broad Blade, or an obtuſe-angled Point; and though the firſt kind of Lancet, that is, the ſmall or ſpear-pointed with a ſhort Blade, always bleeds eaſieſt in a ſkilful Hand, yet the broader kind is ſafeſt for Beginners, to avoid injuring the large Artery and brachial Nerve which lie under the baſilic Vein, and the Tendon or its Aponeuroſis of the biceps Muſcle which lie under the Median.

Q. 198. How do you dreſs after the Operation of Bleeding?

A. After wiping off the Blood, and cloſing the Lips of the Orifice in their natural Poſture, (as the Skin is apt to contract, and occaſion the Fat to protrude, which leaves a troubleſome Ulcuſcule, or at beſt ſince it thus unites with a large Scar) I endeavour as much as poſſible to retain the Skin together with a bit of Diapalma Plaſter, in the middle of which is fixed a bit of clean linnen ſufficient to cover the Orifice; over this I apply a ſquare Compreſs of ſufficient thickneſs, and retain it by the Fillet of about an ell long, one end of which is applied obliquely acroſs the Arm over the Compreſs, letting enough of it hang looſe above the Elbow to tie in a knot, then the other part being carried round below the Elbow and up again, croſſing the former upon the Compreſs, is carried round above the Elbow, and ſo on like a figure of 8, leaving enough to tie with the other end in a knot, on the outſide of the Arm above the Elbow, as in *Tab.* S. *Fig.* 1. D.

Q. 199. When and how do you bleed in the Foot or Hand?

A. In the Hand there are two Veins, the Splenica running on the Back towards the little Finger, and the Cephalica betwixt the Thumb and Fore-finger, which in Children and in ſome grown People, where the other Veins are not conſpicuous, may be opened to advantage. After having firſt bathed the Hand well in warm Water, and fixed a Ligature upon the Carpus, an Orifice is then made by the Lancet, as before directed; and if the Blood does not run freely, the Hand is to be kept in warm Water till a ſufficient quantity is diſcharged. In the ſame manner alſo is the ſaphena and cephalic Vein in the Foot to be opened, after bathing it in warm Water, and tying the Garter tight about the Knee, or rather above the Ancle; but it may be ſafer, eaſier, and equally uſeful to open a Vein at the Ancle, or near the Calf or Ham, if the Veins appear there more conſpicuous, dreſſing the Orifice as before (*Q.* 197.), and retaining the Compreſs by the Bandage deſcribed for a Luxation of the Ancle, *Tab.* S. *fig.* 1. E. Bleeding in the Foot is juſtly reckoned to make a greater Revulſion than that of the Arm in Diſorders of the Head, Thorax, and abdominal Viſcera, eſpecially in a Suppreſſion of the menſtrual or hæmorrhoidal Flux.

Q. 200. When and how do you open the occipital or the jugular Vein in the Neck?

A. Here the Vein is to be firſt rendered turgid by a Neckcloth, or the common Ligature, drawn and held tight about the lower Part of the Neck by the Patient, or an Aſſiſtant;

ant; then preſſing my Thumb upon the Vein which appears faireſt, (on the diſordered Side, if poſſible) I make an Orifice agreeable to what was before directed, applying a bit of Plaſter compreſs, and a circular Bandage after the Operation is finiſhed. Bleeding here is preferred for moſt Diſorders of the Head, Brain, Eyes, *&c.* though it is not ſo commonly in practice as it deſerves. — Sometimes a leſs conſiderable Vein is opened nearer the inflamed or diſordered Part itſelf, as in thoſe which run down on each ſide the Noſe; in the Canthi majores or inner Corners of the Eyes, for an Ophthalmia; in the Veins under the Tongue, for a Quinſy; the Vena dorſalis penis, in a Priapiſm, *&c.*

Q. 201. What are the principal Accidents which may happen to an ignorant or careleſs Surgeon in the opening of a Vein?

A. They are, 1. An *Ecchymoſis*, or Extravaſation of the Blood from the Vein into the cellular Membrane betwixt the Fleſh and Skin, either from the Vein being cut in two, or from a too early and violent Exerciſe of the Arm before the Orifice is cloſed; in which Caſe, if a Diſcuſſion cannot be procured, it muſt be brought to Suppuration, as we directed before. 2.

2. The Puncture of a *Nerve* or *Tendon*, which is inſtantly attended with moſt excruciating Pain, ſoon followed with an Inflammation and Swelling of the Limb, which often ends in Convulſions, a Gangrene, or Death, if not timely relieved: all which muſt be prevented, if poſſible, by repeated Bleeding in the other Arm, by cooling Purges and Clyſters, with a diluent antiphlogiſtic Diet, and two or three drops of *Balſamum Peruvianum* made warm, and applied to the Orifice with ſome Lint, keeping the Arm a little bent in an eaſy Poſture.

3. A Puncture or Wound of an *Artery*, which will plainly manifeſt itſelf by the Blood flying out by ſtarts with great Impetuoſity of a very florid Colour, and which will probably produce an Aneuriſm, or a Gangrene, and Death, if not timely remedied by the application of a bit of Lead, of a ſuitable ſhape, folded up in a piece of clean Linnen, and retained as a Compreſs on the Artery by a ſtrict Bandage; or rather, a Compreſſure is to be made upon the Artery by the Inſtrument deſcribed in *Tab.* A. *Fig.* 1, 2. After this a long Compreſs is to be ſecured upon the humeral Artery by a pretty ſtrict ſpiral Bandage, to break off the Impetus of the Blood

from the Part affected; and the reſt of the Treatment may be conducted as for the Puncture of a Nerve or Tendon, by which means a true or ſpurious Aneuriſm, and their ſeveral Cauſes, may often be prevented.

Q. 202. But is not an Artery ſometimes opened with Deſign?

A. Never but when it is ſmall, and ſeated upon ſome reſiſting Bone, which will ſuffer it to be compreſſed ſo as to prevent an Aneuriſm, as in the temporal and other Arteries of the Pericranium.

Q. 203. When and how do you perform *Arteriotomy* in the Temples?

A. For moſt of the obſtinate Diſorders in the Head and Brain, which will not yield to other Remedies, and eſpecially in Apoplexies and Epilepſies, *&c.* in which Caſes, after inclining the Patient's Head oppoſite to the Light, I place my two foremoſt Fingers upon the Artery at a little diſtance from each other, and boldly make an Inciſion obliquely acroſs it, by the ſtrong double-edged Scalpel, *Tab.* 1. *fig.* L. without injuring the ſubjacent Aponeuroſis, and not fearing if the Artery ſhould be totally divided, ſince any bad

Conſequences may be here prevented by ſuitable Compreſs and Bandage. After the Artery is opened, which I know by the ſtrong and ſalient Efflux of the Blood, I ſuffer the Patient to bleed twenty or thirty ounces more or leſs, and then apply three ſquare Compreſſes, including in the firſt a bit of Lead or Emplaſter rolled up tight, laying on the other two larger Compreſſes, and ſecuring the whole by the knotted Bandage, *Tab.* S. *fig.* 3. which muſt be kept tight upon the Part for near a Fortnight, to prevent an Aneuriſm.

Q. 204. What are the Nature and Signs of an *Aneuriſm?*

A. An Aneuriſm is a ſoft and uſually a throbbing Tumor full of Blood, formed either by the Dilatation or a Diviſion of an Artery; which firſt denominates it a true, and the latter a ſpurious Aneuriſm. A true Aneuriſm is known by its having always a Pulſation in ſome Part or other, diſappearing by Preſſure, and returning again afterwards; but a ſpurious Aneuriſm is when the Artery, being divided, extravaſates the Blood betwixt the Muſcles and Integuments, whence the Part appears livid, diſtended with little or no

Pulſation, but intenſe Pain and an extraordinary Swelling, tending either to Abſceſs or Mortification. Internal Aneuriſms are commonly formed by too great a Diſtenſion of the arterial Coats by ſome Strain or other Violence, whence as the internal Coat will not dilate ſo much as the external, and by the burſting of the internal Coat, the exterior Parts are extended into a Tumor, till ſuddenly breaking, a Period is inſtantly put to the Patient's Life; whence it is evident, that no Relief can be given in this Caſe, but by keeping the Force of the Heart and Arteries low by frequent Evacuations of all kinds, eſpecially bleeding every Month or Fortnight, and feeding on a poor and ſpare vegetable Diet, avoiding all Paſſions, Exerciſe, ſpirituous and ſtimulating Subſtances of all kinds, or any thing which increaſes the Blood's Motion.

Q. 205. When and how do you perform the Operation for an *Aneuriſm* in the Limbs?

A. For an Aneuriſm in the Arm, the Tourniquet is firſt applied above in the Humerus, tightening it till no Pulſation is perceived in the Artery at the Carpus; after which a longitudinal Inciſion is to be made from below upward, that the Artery on each ſide the Aneuriſm may be freed from the adjacent Nerves, and expoſed to view: in the next place, a pretty broad Ligature is conveyed round the Artery above and below on each ſide the Tumor, by the obtuſe-pointed Needle, *Tab.* A. *fig.* 5. and after tying the Ligatures tight, the aneuriſmatic Tumor is laid open by Inciſion, and its Contents diſcharged without cutting the arterial Coats in two tranſverſly. If the Ligature be not very broad, ſome Lint muſt be interpoſed betwixt it and the Artery, to prevent it from being cut through. The Wound is filled with dry Lint for the firſt time, and afterwards with Digeſtives, till the Ligatures and diſeaſed Part of the Artery are caſt off, and the Cure compleated, as in other Wounds. The ſame Method is to be taken with a ſpurious Aneuriſm, after making an Inciſion through the Integuments, and diſcharging the extravaſated Blood, whence the Arm is often ſaved from an Amputation, or from a ſpreading Gangrene, which would in time be fatal. In this manner alſo, with little Variation, are to be treated Aneuriſms in other Parts of the Body, where the Arteries are acceſſible, as behind the Ears, in the Hands, Legs and Feet, *&c.*

Q. 206. In what Parts, and how do you make *Iſſues?*

A. Theſe are ſmall artificial Ulcers, beſt made by pinching up the Skin and Fat betwixt the Thumb and Fore-finger, and dividing them with a Lancet ſo far as to be capable of admitting a large or ſmall Pea, by which they are kept open and running for Diſorders of the Head and Lungs, in which they frequently afford ſome Relief. The Places in which they are uſually made for theſe Purpoſes are in the upper Part of the Head, or in the Neck over each Scapula; in the Arms near the Inſertion of the deltoide Muſcle; within-ſide the Thighs a little above the Knees, *&c.* but to produce any conſiderable Effect, there ought to be ſeveral Iſſues in theſe Parts, and their Diſcharge promoted by an artificial Pea of Wax mixed with ſome ſtrong digeſtive Subſtance, as *pulv. cantharid. gum. myrrh. & elm.* or by dreſſing the Pea with *ung. epiſp. &c.* But Iſſues are ſometimes made by the Cauſtic, as mentioned before (*Q.* 24.), when the Patient will not admit of the Knife.

Q. 207. What is a *Seton*, and how do you make it?

A. This is a kind of double Iſſue made by pinching up the Skin and Fat either by the Pincers, or with the Fingers, *Tab.* M. *fig.* 56. and then perforating them by the Seton Needle, *Tab.* G. *fig.* A. armed with a ſkain of thread or ſilk, either looſe or twiſted together, and ſpread with ſome digeſtive Ointment, which being ſhifted or drawn through the Integuments a little every day, keeps them open and running as in an Iſſue; but as this is more troubleſome, and of no greater uſe, we commonly prefer an Iſſue above each Shoulder, which will anſwer all the purpoſes of other Iſſues, for which they are made.

Q. 208. When and how do you *cup* and ſcarify?

A. This is rarely the Buſineſs of the Surgeon, except in the Country or at Sea, and in caſe of a Gangrene. It is diſtinguiſhed into, (1.) *Dry Cupping*, when the Glaſs, *Tab.* M. *fig.* 1. being applied to the Skin, the Air is rarified by the Flame of a Spirit of Wine Lamp, which being withdrawn with great Celerity, the Glaſs is preſſed cloſe to the Skin, which is conſiderably raiſed and ſwelled into the Glaſs by the incumbent Preſſure of the Atmoſphere; ſo that thus an artificial Inflammation is raiſed in the ſame manner as by violent Frictions of the Skin, to derive the Blood and Humours towards and into the Part cupped, and to make a Revulſion of them from ſome other Parts affected. And theſe Purpoſes are more effectually anſwered, (2.) by *ſcarifying* at the ſame time, that is, by applying the Scarificator, *Tab.* M. *fig.* 4. with the ſixteen Lancet Points to the Skin, into which they are ſuddenly ſtruck by letting looſe the Spring-handle *a*, by depreſſing the Button *b*; and then by applying the Cupping-glaſs as at firſt, a conſiderable quantity of Blood is drawn from the Inciſions, ſo as to anſwer all the Purpoſes of bleeding in other parts when no Vein can be found, or when it would not be ſo ſafe to open a Vein, on account of the Patient's Lowneſs. Thus it may be applied with great ſucceſs to the Occiput for Apoplexies, Head-achs, Diſorders of the Brain and Eyes; and upon the affected Side in a Pleuriſy, after Phlebotomy, it gives great Relief, as alſo in all local Inflammations, Pains, *&c.* But chirurgical Scarification is commonly made by the Scalpel or Lancet in Gangrenes, Mortifications or Dropſies, to diſcharge the offending Humours,

mours, and make way for the topical Remedies to penetrate into the ſounder Parts.

Q. 209. What is the *Fiſtula lachrymalis?*

A. This is of two kinds, *true* or *falſe*. The latter is when the lachrymal Ducts are only obſtructed and dilated, ſo that the Tears cannot paſs from the Eyes into the Noſe, but are forced to run down over the Cheek; but the true *Fiſtula*, beſides the former, is accompanied with an Ulceration in the lachrymal Sack, and a purulent Diſcharge: and this is properly the *Fiſtula lachrymalis*, as the other is rather an *Epiphora*, or watery Eye; which laſt may proceed from a great Number of Cauſes forming an Obſtruction or Concretion of the forementioned Ducts, and occluding the Paſſage of the Tears into the Noſe. The true Fiſtula is either *perfect*, accompanied with an external Ulceration, and a purulent Diſcharge; or *imperfect*, when the outer Integuments remain entire, the Matter being diſcharged into the Noſe only, and a conſiderable Tumor appearing internally. The Diſorder is worſe, as the Ulcer is more inveterate, and complicated with a Calloſity, or a Caries of the adjacent Bones, as the Os lacrymale, Os planum, and the Os maxillare ſuperior. Sometimes the purulent Matter makes its own way through the lachrymal Points, or may be eaſily forced out that way by Preſſure, though the Integuments remain entire; and if the naſal Canal be obſtructed, all or moſt of the Matter is obliged to return up to the Eye through the Puncta lacrymalia, little or none paſſing into the Noſe by the Canalis naſalis. But ſometimes there is no Matter at all diſcharged in this Diſorder; which often proceeds from an inflammatory Tumor in the greater Canthus of the Eye ſometimes tending to Suppuration, which Tumor is called Anchylops before it tends to ſuppurate, and Ægylops when Matter appears: and it muſt be therefore treated accordingly, by endeavouring to diſperſe it in the firſt place, or to bring it to Suppuration in the laſt, to prevent an obſtinate Fiſtula, or a Caries of the adjacent Bones from the ſpreading Diſorder. A free Diſcharge muſt be given to the confined Matter, by making a ſufficient Opening with a Scalpel: or when the Fiſtula is incipient, and the Membranes not yet corroded, it may be often cured by making a Compreſſure with Compreſſes upon the Sack in the greater Canthus, ſo as to prevent the Humours from being retained and corrupted, frequently injecting a Mixture of *S. V. & aq. calc.* with a ſmall Syringe and capillary Tube (*Tab.* X. *fig.* 4.) paſſed through the Punctum lacrymale. But if this does not ſuffice, the lachrymal Sack muſt be laid open by an oblique Inciſion downward, or one convex towards the Noſe, without wounding the lachrymal Ducts, Points or Tarſi of the Cilia. Then the Calloſity is removed by Digeſtives, and the Caries likewiſe, either by ſcraping the Bone, or removing ſo much of it as is vitiated; after which the Os lacrymale is to be perforated to give a Paſſage to the Tears into the Noſe, keeping it open by a ſmall Canula or leaden Probe, compleating the reſt of the Cure as in other Wounds. But this Operation may be prevented, if the Diſorder is taken in time, and the Ducts cleared, by introducing a ſmall capillary Probe, which by a proper Management will paſs through the lachrymal Sack to the naſal Canal; after which an Injection muſt be conveyed by the Syringe and capillary Tube to cleanſe, open and heal the Parts; in which Method the Patient muſt continue, till the Injection paſſes freely into the Noſe without any appearance of Matter. Theſe Paſſages may be ſtill better opened and cleanſed by the Probe and Injections, when there is an Opening immediately through the lachrymal Sack into the Integuments. If it is judged beſt to make a Paſſage into the Noſe by perforating the Os unguis with a ſmall Trocar, Care muſt be taken not to miſtake the Os planum for it, which would cauſe the Opening to be into the *Antrum Highmorianum.* But the Method by probing and injecting is of all the beſt to one well acquainted with the Structure of the Parts, which ought at leaſt to be tried before Inciſion with the uſe of Eſcarotics, *&c.*

Q. 210. What is a *Cataract* and *Glaucoma?*

A. A Cataract in general may be defined an Opacity and Diſcolouration in the Humours of the Eye, obſtructing the Light and viſual Rays of Objects in their Paſſage thro' the Pupil to the Retina. If this Opacity is in the vitreous Humour, it does not appear ſo white or pearl-coloured, as when in the cryſtalline Lens, and is therefore called a *Glaucoma* from its grey Colour: but a Cataract properly ſo called is an Opacity of the cryſtalline Lens, tho' till of late it was ſuppoſed to be a Membrane floating in the aqueous Humour; but where there is one of theſe membranous Cataracts, there are a thouſand of the former, and therefore we may define a Cataract not a Membrane, but an Opacity of the Cryſtalline. Hence Cataracts are diſtinguiſhed into *true* or *falſe*, the Seat of the firſt being in the Cryſtalline, and of the latter, either in the vitreous or aqueous Humour; though ſome call the Amauroſis or Gutta Serena, (which is a Palſy of the Retina or optic Nerve) by the Name of a *Black Cataract*, even though there is no viſible Defect in the Eye. The *true Cataract* is again diſtinguiſhed from its Colour and Conſiſtence into white or grey, *mature* or firm, or immature and *ſhaking*, and with or without *adhering* to the Uvea. This may be eaſily diſtinguiſhed from an Albugo or Speck in the Lamellæ of the Cornea, as alſo from the Pterigium or Unguis, which is a Film adhering to the outſide of the Cornea; and laſtly from the Hypopyon, which is a Collection of Matter in the aqueous Humour immediately behind the Cornea. The true Cataract and the Glaucoma, as well as moſt other Diſeaſes of this Organ, follow from an Inflammation ariſing from any Cauſe in the ſmall Arteries, which are diſtributed from the Retina through the vitreous Body and cryſtalline Lens, and which have been ſometimes manifeſted to the naked Eye by a happy Injection.

Q. 211. How do you treat the *Glaucoma* and Cataract?

A. The former is incurable by any Operation; but the ripe conſiſtent Cataract, that is, the opake cryſtalline Lens, may be couched or preſſed down to the bottom of the vitreous Humour by a Needle, after inciding its Capſule by the ſame Needle, and the vitreous Body in the mean time coming forward, will with the aqueous Humour fill up the ſpace of the Cryſtalline, ſo as to give the viſual Rays of Objects a free Paſſage to the Retina, and reſtore Viſion by the help of a Pair of convex Spectacles. In order to couch the Cataract, after the Patient is conveniently ſecured by two Aſſiſtants, with his Head reclined oppoſite to the Light, I take the Needle, *Tab.* X. *fig.* 1. and holding up the Eye-lids with the Finger and Thumb of the other Hand, or by the Speculum Oculi, *Tab.* X. *fig.* 5. I order the Patient to turn the Eye towards his Noſe; then holding the Needle as one would a Pen, reſting the lower fingers upon the

Cheek, I carefully enter its Point about the middle of the White, betwixt the Cornea and external Angle of the Orbit, *Tab.* II. *fig.* 5. at about the ſixth part of an Inch from the Cornea, and thruſt it perpendicularly thro' the Coats of the Eye down to the Cataract, which being entered about the middle, after dividing its Capſule by the Edge of the Needle, is then depreſſed to the bottom of the Eye, below the Pupil, and the Needle is to be withdrawn cautiouſly, that the Cataract may not riſe again, which compleats the Operation. If the Cataract is found to adhere, it muſt be firſt ſeparated by the Needle before it is couched; and if it ſhould not appear conſiſtent enough to bear the Reſiſtance of the Point of the Needle, the couching of it may be better referred to another Opportunity, when it is come to greater maturity. The Eyes are then both of them bound up (*Tab.* S. *fig.* 4.) and the Head retained for a conſiderable time in a Poſture as erect as poſſible, to prevent the Cataract from riſing, which will require it to be couched again. In the next place the Patient is to be bled, and treated with an antiphlogiſtic Regimen to prevent an Inflammation; and as Sickneſs at Stomach with vomiting generally follows after the Operation, from the

Conſent of the Nerves, a cooling Stomachic and anodyne Draught ſhould be given, to compoſe the Patient to reſt as ſoon as poſſible, and the Bowels are to be kept looſe. The famous itinerant Oculiſt Dr. *Taylor* makes an Inciſion with his Needle firſt in the vitreous Humour under the cryſtalline Lens, and then inciding the Capſule of the Cryſtalline, he couches the opacous Lens, by depreſſing it under the vitreous Humour without wounding the ciliary Ligaments.

Q. 212. How do you dreſs after couching?

A. In the firſt place a Compreſs dipped in ſome cooling Liquor is applied and retained upon the Eye by the Bandage, *Tab.* S. *fig.* 4. and the like is repeated upon the other Eye, if that is alſo diſordered; and the whole Head may at laſt be inveſted by the Grand-kerchief, *Tab.* S. *fig.* 1.

Q. 213. What is an *Hypopyon*, and how do you treat it?

A. This is a Collection of purulent Matter immediately in or behind the Cornea, from an Inflammation and Suppuration proceeding from any violent Cauſe. In order to remove this Complaint, the Inflammation and Matter muſt be diſperſed if poſſible by bleeding, cooling Purges and diſcutient Topicals as before (Q. 17.) But if this Method does not ſucceed, an Inciſion muſt be made with a fine Lancet in the lower Part of the Cornea, at near the diſtance of the tenth of an Inch from the Albuginea, making the Opening ſufficiently large to diſcharge the Matter, together with the aqueous Humour, (without wounding the Uvea) forced out by a gentle Preſſure and Direction with the Fingers; and then the Eye may be dreſſed with a Compreſs dipped in a Solution of the Trochiſci albi *Rhaſis* in Roſe-water, ſecured by Bandage as before (Q. 212.). This Operation may be likewiſe performed to diſcharge extravaſated Blood, when it cannot be diſperſed.

Q. 214. How do you treat *Deafneſs* and Pain in the Ear?

A. The Treatment in this Diſorder varies according to the Cauſe. In the firſt place, the Light of a Candle is to be directed into the bottom of the Ear by a convex Lens, and if Wax appears to be the Obſtacle, it muſt be firſt mollified with a little Oil, and afterwards extracted by a convenient Inſtrument, or elſe waſhed out by injecting warm Milk or Water (by a Syringe) in which a ſmall quantity of *Venice* Soap has been diſſolved. If any other foreign Body appears, it muſt be extracted by the Pliers or Hook. If the Meatus auditorius and Tympanum are inflamed ſo as to cauſe the Ear-ach, which is often very excruciating, it will be proper to blow in warm diſcutient Vapours by the Fumigator, *Tab.* V. *fig.* 3. or to ſyringe the Ear with a Solution of the *Trochiſci albi Rhaſis* in warm Milk, decanted after it has ſtood a little while for the Ceruſe to ſubſide; and if theſe do not ſuffice, Bliſters may be applied behind the Ears, a cooling Purge may be taken, and the Patient bled, *&c.* as in other Inflammations (*Q.* 17.)

Q. 215. What is the *Ozæna*, and how do you treat it?

A. The Ozæna is a foul and malignant Ulceration of the pituitary Membrane in the Noſe, with or without a Caries of the adjacent Bones, diſcharging a foul Matter, and attended with a ſtinking Breath. If this happens in the Cavity of the upper Jaw over the grinding Teeth, it is termed an *Ozæna in antro.* In order to the Cure, Mercurials with a Decoction of the Woods muſt be given internally, while externally is uſed an Injection *ex aq. roſar. ℥viij merc. præcip. virid. gr. iij*, or a mixture of *aq. calc. cum merc. dulc.* or elſe by fumigating with Cinnabar, conducting the Fumes by a Pipe. But for the *Ozæna in antro*, one or more of the ſuperior grinding Teeth are to be extracted, and an Opening made through the Socket with the Point of the Sciſſars, or ſome other Inſtrument into the Sinus, for diſcharging the Matter, and deterging the Parts with an Injection *ex tinct. myrrh. cum mel. roſar.* which being once injected into the Sinus, muſt be retained for ſome time there with a Tent in the Opening, which muſt not be ſuffered to cloſe up till the *Antrum* is well cleanſed and healed.

Q. 216. How do you remove *Polypus's* in the Noſe?

A. Theſe are fleſhy Excreſcences of the pituitary Membrane, of various forms and ſizes, obſtructing the Cavity of the Noſtrils and Fauces, ſo as to deprave the Voice, Deglutition and Reſpiration; being ſometimes cancerous, and extremely painful. The Cure will be more or leſs difficult, as the Excreſcence is mild and fleſhy, ſcirrhous or cancerous; and as it is more or leſs extended, and eaſily acceſſible. The Cure is performed by Extirpation (either by Ligature or Abſciſion) with a Pair of Sciſſars of a convenient ſhape; or if by theſe means a dangerous Hæmorrhage is feared, it may be ſometimes removed by Cauſtic. But the moſt common Method in Practice is to extract the Polypus by a Pair of Forceps, *Fig.* 6. *Tab.* M. with Apertures in their Extremities to take the better hold. With theſe Forceps the Polypus may be extracted by the Mouth, when it appears in the Fauces, while the Patient is inclined with his Head back as much as poſſible, that the Polypus may ſtretch itſelf, and come down into the Fauces by its own Weight: but if the Polypus is ſmall and lies forward, the Forceps muſt be introduced by the Noſtril, and the Excreſcence that way extracted by the Roots, obſerving not to leave any Remains, if poſſible, to prevent a Return of the Diſorder. The Remains may be beſt removed by Eſcharotics, conveyed to the Part by a Wax-candle or Probe, after they have been mixed with ſome Digeſtive, and ſpread, or elſe barely ſprinkled upon a ſmall doſſil of Lint. If the Hæmorrhage ſhould prove exceſſive,

ceſſive, a little *alcohol vini*, or *Eaton*'s Styptic, applied with Lint will ſuppreſs it.

Q. 217. How do you perform the Operation for the Hare-Lip?

A. The Hare-Lip is thus called from its being divided in the middle, and expoſing the Teeth, as in a Hare or Rabbit. When the Lip has a double Diviſion like the Letter M, it is then termed a double Hare-Lip; but a ſingle Diviſion in the lower Lip not from the Birth, is termed a ſpurious Hare-Lip. The Operation conſiſts in taking off the Skin from the Edges of the Fiſſure in an even Direction with a Pair of fine Sciſſars, having firſt divided the Frænulum of the Lip joining it to the upper Jaw and Gums, and then the raw Parts are to be applied and retained together by paſſing through them one, two, or three Needles, (*Tab.* I. *fig.* T and V.) according to the length of the diviſion. The Needles are inſerted at about the diſtance of two tenths of an inch, or two lines from each other, beginning with the uppermoſt next the Noſe, and their extremities or ends come out of the Lip at about the ſame diſtance from the Fiſſure. The Needles thus entered, and the Blood dried up with a

Sponge, there is next applied a waxed thread twiſted round them like the figure ∞, as in *Tab.* C. *fig.* 8 and 9. termed the twiſted Suture. Thus the bleeding Lips being retained together, and the ends of the Needles cut off, or prevented from doing injury by a bit of Sponge or Emplaſter laid under them; there may be next applied a Pledget of Lint dipped in *mel roſarum*, internally betwixt the Lip and Teeth; or omitting this, I uſe only a like Pledget dipped in *Fryer*'s Balſam applied externally, over that ſome dry Lint, and a Compreſs, ſecured by the Sling with four Heads, as in *Tab.* S. *fig.* 5. Thus the Dreſſings are to be left until the third, fourth or fifth day after the Operation, when, if the Lips appear conjoined, the middle Needle may be extracted, or the upper one when there are two; continuing to dreſs with ſome vulnerary Balſam, until the Lips being conjoined, in about a fortnight's time, the threads are to be cut, the pins extracted, and the Cure is compleated, as in other ſuperficial Wounds.

Q. 218. How do you treat a *Cancer* of the Lip?

A. The Nature of this may be underſtood from what was ſaid before of Cancers (*Q.* 41, *&* *ſeq.*) If it does not yield to internal Medicines with Mercurials, but becomes more malignant, I extirpate the cancerous Part by Inciſion with a Lancet, obſerving rather to take ſome of the ſound Parts, than to leave the leaſt bit of the Cancer remaining; after which the reſt of the Cure may be performed as in the Hair-Lip.

Q. 219. How do you treat a *Cancer* of the Tongue?

A. This may be the Conſequence of an Inflammation and Scirrhus, induced by the Irritation of ſome ſharp Fragments of a Tooth, or from an internal Diſorder of the Humours likewiſe; and therefore, in order to a Cure, the Aſperities of the Teeth are to be removed by a Raſp or File, *Tab.* 1. *fig.* C. or by pulling them out; and if the cancerous Tumor does not yield to the application of *Fryer*'s or the *Peruvian* Balſam with internal Medicines, it muſt be extirpated as ſoon as poſſible, unleſs it be rendered impracticable by ſpreading itſelf through the Root of the Tongue. After the ſcirrhus or cancerous Part is extirpated, I dreſs with *mel roſar.* and *balſ. Peruv.* deterge with Myrrh, and heal with a Linctus of Oil of ſweet Almonds with Loaf-ſugar, keeping the Patient under a proper Regimen of Diet with internal Medicines.

Q. 220. When and how do you ſcarify the Tonſils?

A. When theſe Glands are ſo violently inflamed as to threaten Suffocation or a Gangrene, after repeated bleeding and the moſt powerful antiphlogiſtic Remedies are uſed without effect, it will be neceſſary to ſcarify them with the Inſtrument, *Tab.* T. *fig.* 7. or with the Lancet, firſt inveſted with a ſlip of Plaſter within a little way of the Point, to prevent it from entering too deep; and if Cupping is at the ſame time outwardly uſed upon the Neck with ſuitable Gargles, the Tumor will probably be reduced, and Suffocation prevented without Bronchotomy, which may otherwiſe become abſolutely neceſſary.

Q. 221. How do you open an Abſceſs in the Tonſils?

A. If the Inflammation is followed with a Suppuration in theſe Glands, I depreſs the Tongue with a Spathula, Spoon, or the Speculum oris, *Tab.* V. *fig.* 2. and with one of the longeſt Lancets inveſted as before with a ſlip of Emplaſter, to within a third or one fourth of an inch of the Point, I make an Inciſion in that part which bids faireſt; after which, when the Matter is expreſſed, the parts may be gargled with Jelly of black Currants mixed with Juice of *Seville* Oranges, the Efficacy whereof has been frequently experienced in Tumors and Inflammations of theſe Parts.

Q. 222. When and how do you extirpate ſcirrhous Tonſils?

A. If theſe Glands are ſo much enlarged and indurated as to form an irreſolvable Scirrhus, threatening worſe Conſequences and a Suffocation; I then proceed to remove them by Extirpation, rather with the Ligature than by Inciſion, becauſe the former Method is commonly attended with a very profuſe, or even ſometimes a fatal Hæmorrhage. The beſt Method of applying the Ligature for this purpoſe ſeems to be that of Mr. *Cheſelden*, namely, to perforate the bottom of the Tonſil by the Needle armed with a double ſtrong thread, *Tab.* V. *fig.* 1.; and when the Ligature appears through the Gland, it may be drawn up to the Mouth by a Hook, then divided and the Needle extracted, leaving the two threads ſtill in the Gland with their four Extremities coming out at the Mouth. This done, each of the threads may be tied, ſo as to compreſs each of them one half of the Gland, the one above and the other below; the knots muſt be double, and the Ligature cut off pretty near them, by which means a ſeparation will be made in two or three days if the Ligatures continue tight, otherwiſe the Operation muſt be repeated to make a greater Stricture.

Q. 223. How and when do you perform the Operation of Bronchotomy?

A. This is a ſort of Paracenteſis of the Wind-pipe, made to give a free Communication of the Air into the Lungs, when the Trachea or Larynx is compreſſed or obſtructed in a Quinſy, to prevent Suffocation, or to inflate Air into the Lungs of a Perſon lately ſuffocated to recover him; but for want of more numerous Precedents, the Operation, though ſafe, is rarely performed. It conſiſts in making a longitudinal Inciſion of about an inch in extent through the Integuments, and as much below the ſcutiform Cartilage; and after freeing the Integuments and Muſcles from the Wind-pipe, drying up the Blood with a ſponge, and keeping the Parts aſunder with the fingers, I make a ſmall tranſverſe Inciſion betwixt the cartilaginous Rings, and then introduce a ſilver or leaden Canula, not perfectly round but depreſſed, of near an inch in length, and furniſhed with a couple of rings like handles at the top, to prevent it from ſlipping in, and to ſecure it by a Ligature round the Neck. If the Canula is found too long, it may be ſhortened relatively by paſſing it through one or more Compreſſes of Emplaſter perforated before it is introduced; beſides which, it will be likewiſe proper to have a ſecond Tube to fit within the former, that it may be taken out and cleanſed occaſionally, if it ſhould be obſtructed by mucus or moiſture. Thus Suffocation may be prevented, till the Inflammation and Swelling can be removed by bleeding and proper Medicines; after which the Canula being removed the Parts will readily cloſe, and the Wound heal in a few days time, only by dreſſing with *Fryer*'s Balſam, or *Linimentum Arcei*, *&c.* Some adapt a triangular Bodkin to the Canula, and introduce it like the Trocar without any previous Inciſion. See *Tab.* V. *fig.* 11.

Q. 224. How do you extirpate ſcirrhous or cancerous Breaſts?

A. In this, as in other Amputations, I endeavour to preſerve a good deal of the ſound Integuments, by dividing them round higher than the bottom of the Inciſion, by which the Breaſt is removed; in order to which the diſeaſed Breaſt muſt be elevated either by the ſingle or double Fork, *Tab.* P. *fig.* 3 and 5. or elſe by paſſing two Needles tranſverſly under its Baſis, as in *Fig.* 1. *Tab.* P. and tying the threads all four together in a knot, as in *Fig.* 2. After the Extirpation the larger Arteries are to be taken up or conſtringed with a Needle and thread, tying up ſome of the Fleſh along with the Veſſel; and the ſmaller may be compreſſed by applying a large doſſil of dry Lint laid on unequally, thickeſt upon the Veſſels, and retained by a pretty tight Bandage. See what has been ſaid before of Cancers (*Q.* 41, & *ſeq.*) I next compleat the Dreſſing with a Compreſs, and a double-headed Roller of ſix ells long, and near a hand's breadth, applied with its middle under the ſound Axilla A, *Tab.* T. *fig.*

fig. 1. and croſſing the Roller-heads at B, they are carried obliquely acroſs the Breaſt and Back to the other Axilla D, where being croſſed again, and drawn tight upon the Compreſs and Dreſſings of the Breaſt E, F, are again carried up to B, and ſo repeated, till when the Bandage is near ſpent, you terminate it circularly round the Thorax on the Dreſſings in the Direction A, D.

Q. 225. When and how do you perform the *Paracenteſis* of the Thorax?

A. This is an Opening made into the Thorax, uſually betwixt the Ribs, to diſcharge ſome Matter contained in that Cavity, whether Blood in Wounds, purulent Matter in an Empyema, or extravaſated Water in a Dropſy of the Thorax. Being firſt aſſured which ſide of the Thorax is moſt proper to be opened, from conſidering the Seat of the preceding Inflammation, from the Weight, Tumor and Fluctuation, and from the Patient's lying eaſieſt on that ſide, I then proceed to make an Opening by Inciſion, firſt through the Integuments, betwixt the ſecond and third of the lower falſe Ribs, about four fingers breadth beneath the lower angle of the Scapula, and as much from the Spine, obſerving that the Point falls upon the Interval betwixt the Ribs. The Place being thus determined, and marked with Ink, and the Patient's Body inclined a little backward to relax the Skin, I then take up the Integuments with the latiſſimus dorſi Muſcle, and divide them all together by a longitudinal Inciſion of three or four finger's breadth. This done, I order the Patient to lean towards the ſound ſide, that the Ribs may be drawn from each other ſo as to ſtretch the intercoſtal Muſcles, which I next divide, together with the Pleura, by a crooked Scalpel, with the Point ſecured by the end of the finger; and with great caution I make a ſmall Opening firſt, to avoid wounding the Lungs, if they ſhould adhere to the Pleura; which if they do not, the Air entering will cauſe them to collapſe, and put them out of danger, ſo that the Wound may be eaſily enlarged by the obtuſe-pointed Scalpel, *Tab.* I. *fig.* A. guided with the edge downward, to avoid injuring the intercoſtal Veſſels. If the Lungs adhere, I endeavour to ſeparate them gently from the Pleura with my finger, or by forcing in ſome Liquor by Injection, or rather included in a Bladder, according to the Advice of *Hippocrates.*[*] But if the Adheſion

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[*] De Morb. Lib. II. cap. 23.

is beyond the Extent of theſe Artifices, the Operation will indeed be uſeleſs, though no Reflection can be juſtly caſt upon the Operator. The Opening thus made, I promote the Diſcharge of the contained Liquor, by ordering the Patient to cough, diſpoſing his Body in a proper Poſture, by throwing in ſome deterging Injection, and by extracting, if neceſſary, with a Syringe and Pipe, repreſented in *Tab.* F. *fig.* 1 and 6. I then keep open the Wound as long as the Diſcharge ſeems neceſſary; which if large, the firſt time the Patient muſt be treated with Cordials, and a proper Compreſſure upon the Abdomen, to ſupply the Tone of the Diaphragm loſt by the incumbent Weight of the Fluid.

Q. 226. When and how do you trepan the *Sternum?*

A. We know from Anatomy, that there is an Interſtice filled with the cellular Membrane betwixt the Duplicatures of the Mediaſtinum immediately under the Sternum, in which if an Abſceſs be formed from a Blow, Fracture or Inflammation, I then make an Opening betwixt the lower Cartilages on the left ſide with a Scalpel, or by the Trepan in the lower Part of the Sternum where the Abſceſs ſeems to point, as was directed before in trepanning the Skull (Q. 128.) to diſcharge the Matter, and heal the Parts by Injections, *&c.* The Dreſſings here, as in the laſt Opening of the Thorax, muſt be made with Lint, Emplaſter, Compreſs, and the Napkin and ſcapulary Bandage, *Tab.* S. *fig.* 9.

Q. 227. When and how do you perform the *Paracenteſis* of the Abdomen?

A. This is performed in that ſpecies of the Dropſy called Aſcites; for if the Water be contained in the cellular Membrane, or in Hydatides, it cannot be thus evacuated; and even at beſt it only gives a reſpite to the diſorder for a time. If then the Water appears to be extravaſated by its Fluctuation and Senſe to the Touch, and the Urgency of the Symptoms renders the Operation neceſſary, the Patient being ſeated conveniently in a Chair, muſt preſs both his hands upon the upper part of the Abdomen, and then having oiled the Trochar, I ſtab it ſuddenly through the Integments, without danger of wounding the Inteſtines, which are removed to a conſiderable diſtance from the Peritonæum by the included Water. The Part moſt convenient for this, is about three fingers breadth below the Navel on the left ſide of the Abdomen;

domen; but ſometimes when the Navel protuberates, it may be punctured by the Lancet, and the Waters that way diſcharged without danger of a Rupture following. If the end of the Canula is obſtructed by a part of the Inteſtine or Omentum during the diſcharge of the Water, I clear it by the Probe, obſerving to keep a due preſſure upon the Abdomen by the hands of an Aſſiſtant, as the Water is diſcharged, leſt the Patient ſhould faint; and for the ſame purpoſe the like Compreſſure muſt be continued after the Operation, by rolling the Abdomen tight, after a Flannel has been applied dipped in ſpirit of Wine, ſo as to keep the Inteſtines up againſt the Diaphragm for three or four days, till the Parts have recovered their due tone. The Dreſſing may be made with dry Lint, and a Plaſter that will adhere firmly. Thus the Patient's Life may be protracted for many years free from uneaſineſs, though the Diſorder, it muſt be confeſſed, is very rarely thus cured. By continuing a Preſſure upon the Abdomen, we are enabled to draw off the whole quantity of Water at once, which formerly they did not attempt for fear of the Patient's fainting. I once knew an aſtringent Injection with diluted Spirit of

Wine injected after the Operation with ſucceſs, the Patient afterwards recovering; and this Practice ſeems adviſable whenever the Dropſy ariſes from a Rupture, or too great a Dilatation of the Lymphatics, as the exhaling Veſſels will by that means be contracted.

Q. 228. How do you define and diſtinguiſh Ruptures?

A. A true Rupture is a Tumor formed by a Diſlocation and Interception of the Inteſtines or Omentum uſually at the Navel, Inguen or Scrotum; and according to the Part where the Tumor is formed, and its particular Contents, it is variouſly denominated either an Exomphalos, Bubonocele, Oſcheocele, *&c.* or Enterocele, Epiblocele, Pnematocele, Hydrocele, *&c.* and theſe again compounded make the Enteromphalocele, Epiplomphalocele, *&c.* but the moſt common of theſe is the Bubonocele, formed by a Prolapſion of the Inteſtine or Omentum through the Rings of the abdominal Muſcles, either into the Groin or Scrotum. Though theſe are called Ruptures, yet the Peritonæum is for the generality only dilated into a Sacculus, containing the Inteſtine or Omentum confined betwixt the Muſcles or Tendons, where they are prolapſed.

The term *Hernia* then in general denotes a Luxation or Diſlocation of ſome of the ſoft Parts contained in the Abdomen; though 'tis commonly reſtrained to Ruptures dilating the Peritonæum. But it is evident the term Rupture conveys a falſe Idea, ſince the Peritonæum is only dilated and not broke, as indeed I never knew that it was. There are three places in the Peritonæum, where it is not defended by the abdominal Muſcles; two at the Groins, where in Men the ſpermatic Veſſels paſs through in a Bundle, and in Women are tranſmitted the Ligamenta rotunda of the Uterus; and the third place is at the Navel. The Peritonæum lines the whole Cavity of the Abdomen on all ſides, and receives the Viſcera into its Folds or Duplicatures; but at the Loins, the Aorta and its Branches are placed under the Peritonæum; and therefore when the ſpermatic Veſſels paſs out through the abdominal Muſcles, they do not perforate the Peritonæum, which is there only incumbent on them, and faſtened to the Tendons of the Muſcles, through which the ſpermatic Veſſels deſcend: but in this place there is no Muſcle to ſupport the Peritonæum, only Fat, Veſſels, and Skin, which afford little or no Reſiſtance. Now when the

Peritonæum is preſſed outward by a more violent internal force than is uſual, it does not break, nor even dilate, except in theſe Parts where there is the leaſt reſiſtance. When this Sacculus or Production of the Peritonæum reaches the Inguen, it is called a *Bubonocele*; when it deſcends into the Scrotum, *Oſcheocele*. In the ſame places, namely, through the abdominal Rings, in Women there are Blood-veſſels aſcend from the Thighs to the Uterus, as there are in Men deſcending to the Teſticles; and therefore the Peritonæum may in theſe places be diſtended in Women, as well as in Men. When there is a Tumor thus produced betwixt the Thigh and ſide of the Pudendum muliebre, it forms a Bubonocele; when the Tumor deſcends into the adjacent Part of the Thigh itſelf, it is called Hernia cruralis; which has been ſometimes known to deſcend even to the knee, where the Tumor being opened by an imprudent Surgeon for an Abſceſs of the Thigh, the Inteſtine has been perforated, and diſcharged its contained Fæces. But in this Sacculus, formed by a Dilatation of the Peritonæum, there is nothing contained but what it receives from the Cavity of the Abmen, namely, 1. An elaſtic Matter or Flatus,

tus, whence the Diſorder is denominated *Pneumatocele*; or, 2. The natural Moiſture of the Abdomen condenſed into the form of a watery Liquor without being abſorbed, which makes the firſt Species of the *Hydrocele*, in which the Water is either capable of being returned into the Abdomen by lying down on the Back, or not. 3. The Omentum prolapſed, whence the Diſorder is denominated *Epiplocele*. 4. The Inteſtines prolapſed, whence the *Enterocele*. All theſe prolapſed Parts in a Hernia never touch the ſpermatic Veſſels, but deſcend near them in a Sacculus of the Peritonæum, while the Veſſels themſelves remain free, except from a Compreſſure by the hernial Tumor; for the ſpermatic Veſſels take their courſe through the cellular Membrane, which likewiſe encompaſſes the prolapſed Inteſtines. When this Diſorder has been of long ſtanding, the hernial Sacculus commonly adheres to the adjacent Parts, and can never be returned. The Cure conſiſts in preventing the Inteſtines from deſcending into the Sacculus, which is performed by Compreſſion long continued, with a ſuitable Truſs; whence the Membranes of the Sacculus grow together, ſo as to cure the Diſorder radically.—But although generally ſpeaking the Peritonæum is uſually dilated only at the places before-mentioned, namely, at the Navel or Groins; yet if there ſhould be a Weakneſs, or leſs Reſiſtance in ſome other part of it, from a Wound or any other Cauſe, it may dilate there, and inſinuate betwixt the abdominal Muſcles together with the Inteſtines or Omentum; and then the Diſorder is termed a *Ventral Hernia:* and this Rupture may be juſtly ſuſpected, when the common Symptoms with a great Pain and Vomiting attend, while there is no appearance of the Tumor at the Navel, Scrotum, Inguen or Thigh; for if the very ſmalleſt part of the Inteſtine is intercepted betwixt the abdominal Muſcles, it may ſuffice to produce the Symptoms, with even a Mortification and Death, if neglected. In this Caſe therefore a Dilatation muſt be made, and the Inteſtine returned, as in other Ruptures, preventing a Relapſe by ſuitable Compreſſion with the Bandage of *Tab.* S. *fig.* 9.—To theſe we may add ſome uncommon or anomalous Herniæ, particularly of the Bladder.—Herniæ of the Bladder were firſt deſcribed by *Ruyſch*[a] in his chirurgical Obſervations, where he tells us of a Prolapſus of the Vagina together with the Bladder, ſo as to afford the appearance of a Prolapſus Uteri; till at length having opened the ſuppoſed Uterus through the Importunities of the tortured Patient, it was found to be the Bladder, from whence he extracted a great number of Stones, and afterwards cured the Patient. It is indeed much more difficult for the Bladder to prolapſe in Men; yet there are ſome Inſtances of this, as may appear from the Hiſtory given us by *Ruyſch*[b], of a large Tumor formed in the Peritonæum and Scrotum, by violent ſtraining in a Retention of the Urine, from an Obſtruction of the Urethra; nor did the Urine diſcharge itſelf by the Catheter when introduced, unleſs when the Patient compreſſed the Scrotum with his hand; and again, the Urine ceaſed to flow as ſoon as that Compreſſure was diſcontinued. The Bladder in the Male is placed under a Production of the Peritonæum, at no great diſtance from the Groin, in which is the Seat of Ruptures. If now the Bladder is more than ordinarily full by retaining the Urine too long; and if at the ſame time there is a Cavity, or leſs Reſiſtance to it in that part where is the Seat of Ruptures, then by ſtraining to diſcharge the Urine, the overdiſtended Bladder dilates in that part into a

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[a] Obſ. Chirurg. 1 & 98.

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[b] Ib. Obſ. 98.

Sacculus without the Peritonæum, and deſcends in that part where the ſeminal Veſſels deſcend into that Sacculus, where the Inteſtines uſually prolapſe; nor is it difficult to underſtand, that the Bladder, being preſſed on all ſides, will yield in that part where only it is not reſiſted.

Q. 229. How do you treat the *Hernia inguinalis?*

A. The Operation conſiſts in returning the prolapſed Inteſtine or Omentum again into the Abdomen from the Inguen or Scrotum, either by the Fingers or with Inciſion, and keeping them there by the application of a convenient Truſs or Bolſter. If the Inteſtine has lately prolapſed, and neither adheres, nor is too much ſtrangled or compreſſed by the Stricture of the abdominal Ring, ſo as not to make it tumefied or inflamed, it may for the moſt part be eaſily returned by the Fingers, and may be eaſily prevented from ſubſiding again by a Truſs; but if the Omentum is likewiſe prolapſed together with the Inteſtine, as it cannot be ſo eaſily returned as the former, it may be left in the Scrotum, which muſt be conſtantly ſupported by a Bag-truſs, and by filling up the ſpace will prevent the Inteſtine from ſubſiding again. But if as it often happens, the Inteſtine conſtringed by the Rings of the abdominal Muſcles is ſo much inflamed and ſwelled, as to prevent its return into the Abdomen by the Fingers, the Paſſage muſt be immediately dilated by Inciſion to prevent a Mortification, which otherwiſe happens in a little time; and indeed the Patient will ſeldom ſubmit to the Knife, before the Gangrene is too far advanced to recover the Inteſtine to its natural and ſound State, which is commonly a mortal Caſe; though we have often Inſtances of the gangrenous Part ſeparating, and the End of the Inteſtine afterwards adhering to the Wound, forms an artificial Anus. The Reduction then muſt be firſt immediately attempted with the fingers, aſſiſted with plentiful Bleeding, Clyſters and Fomentations, or a Cataplaſm of Oatmeal, Vinegar and Oil; or if the confined Flatus will not ſuffer the Inteſtine to return by theſe Means, it may be let out by puncturing with a tubulated Needle. But if the Symptoms increaſe, and all theſe Means prove inſufficient, I immediately begin an Inciſion above the Rings of the Muſcles, and continue it downward thro' the Membrana adipoſa for about a hand's breadth, and then free the cellular Membrane from the Peritonæum, which is next divided carefully, to avoid injuring the Inteſtine, which is commonly ſecured by a ſmall quantity of a ſerous Liquor. If Part of the Omentum is prolapſed and mortified, it muſt be cut off before it is returned, and then the abdominal Rings muſt be laid open by Inciſion, either by the obtuſe-pointed Scalpel, *Tab.* I. *fig.* 1. or by dividing with the Probe-Sciſſars, and keeping down the Inteſtines from being injured by preſſing with the finger, and continuing the Inciſion about an inch upward, more or leſs, as may be found neceſſary; then the Inteſtine being returned, the Lips of the Wound are to be brought and held together by two or three ſtitches thro' the ſkin only with the interrupted Suture; and the Patient muſt conſtantly lie on his Back in the Bed till the Wound is healed, as we directed in other Wounds (*Q.* 145, *& ſeq.*) But if the Inteſtine adheres to the Peritonæum, and the Peritonæum to the Tunica vaginalis and ſpermatic Veſſels, it proves exceeding troubleſome to free them, as may be ſeen in the Caſe given us by Mr. *Claudius Amyand*, *Phil. Tranſ.* N° 443. Thus the Omentum or Epiplocele is alſo to be reduced; and the Operation for the Bubonocele in Women is performed in the ſame manner.

Q. 230. What do you underſtand by the *crural* Rupture?

A. This happens to either Sex, but more eſpecially to Women, from a Prolapſion of the Inteſtine, Omentum, or both, through the Arch in the Os pubis, and under the Ligamentum Poupartii to the inſide of the Thigh by the Tendons of the pſoas and iliacas internal Muſcles, which together with the iliac Veſſels paſs out of the Abdomen thro' the ſame Arch. Here the Reduction muſt be made as before, and by dividing the Ligament inſtead of the abdominal Rings, conducting every thing elſe as in the Bubonocele.

Q. 231. What is Nature and Treatment of an *Exomphalos?*

A. This is a Tumor formed at the Navel by a Protruſion of the Inteſtines or Omentum, cauſed by ſome Violence, Straining, Coughing, or difficult Labour in Women, and frequently for want of tying the Navel ſufficiently cloſe or near to the Abdomen in Children. Nor is this kind of Rupture ſo

dangerous

dangerous as the others, either in Infants or Adults, unleſs it be neglected. The Reduction muſt be made, if poſſible, by the Fingers; otherwiſe an Inciſion muſt be made above the Tumor on the ſide of the Navel, and the Ring dilated by the Knife aſſiſted with the Finger, as in the Bubonocele. After the Inteſtine or Omentum is returned, the Integuments may be ſtitched together, and when the Wound is healed, a Compreſs or Truſs ſhould be wore for ſome time, till the Parts have acquired their due firmneſs. If the Inteſtine is intercepted betwixt ſome of the Interſtices of the abdominal Muſcles in other Parts, it is uſually termed a *ventral Hernia*, which if not reducible by the Fingers will require the Operation as before; and in all theſe Caſes it will be neceſſary to wear a Truſs, till the Cicatrix is become ſufficiently firm, *Tab.* S. *fig.* 9.

Q. 232. How many Kinds of ſpurious Ruptures do you make?

A. A ſpurious Rupture is any Tumor of the Scrotum, in which there is no Prolapſion of the Inteſtine or Omentum, being formed either by watery Humours, a Scirrhoſity of the Teſticle, or an Enlargement of the ſpermatic Veſſels; according to which the Tumor is denominated either an Hydrocele, Sarcocele or Cirſocele, the laſt being alſo termed *Hernia varicoſa* or *humoralis*.

Q. 233. What is the Nature and Treatment of the *Hydrocele?*

A. This is a dropſical Tumor of the Scrotum, in which the Water is either confined within the cellular Membrane, or extravaſated in the Tunica vaginalis, being eaſily diſtinguiſhable from each other by the Touch. If the Diſorder is local, or confined to this Part only, it will be convenient to diſcharge the Water by an Inciſion continued to the length of two or three inches on each ſide the Scrotum into the cellular Membrane; otherwiſe if the Diſtenſion is not great, and the Diſorder an univerſal Anaſarca, it may be as convenient to ſcarify the Legs, and make a Drain for the Water that way. But even when the Water is collected in the Tunica vaginalis, when accumulated to ſo great a quantity as to be very troubleſome, it may be better diſcharged by making a Paracenteſis with the Lancet than by the Trochar, dividing the Scrotum in its lower Part, and not with too long a Lancet for fear of wounding the Teſticle. But after all, it muſt be confeſſed that this Operation is better let alone, if the Diſorder can be removed by proper external and internal Remedies, ſince a Gangrene too frequently follows in the Scrotum after the Tunica vaginalis has been expoſed to the Air.

Q. 234. What is the Nature of the *Sarcocele*, and the Method of caſtrating?

A. A Sarcocele is an Induration and Enlargement of the Teſticle, frequently turning to a perfect Scirrhus, and ſometimes degenerating into a cancerous Diſpoſition, with an Ulceration and moſt acute Pains. If the Sarcocele is recent, or not too much indurated, it may be brought to Suppuration by the application of warm Cataplaſms with the Gums, aſſiſted with Mercurials and a Decoction of the Woods internally. But it would be improper to attempt to bring the Teſticle to Suppuration, when it is only inflamed from an Obſtruction of the Vas deferens, whence the Epididymis becomes greatly tumefied, becauſe that may be diſperſed by bleeding, purging, gently compreſſing the Epididymis, and ſuſpending the Teſticle with a Sling; or if it turns to a Scirrhus, there is no danger of its becoming cancerous, as it would if in the Body of the Teſticle itſelf. If then the Teſticle itſelf appears from its Size and Pain to incline towards a Cancer, the Diſorder not having extended through the ſpermatic Cord above the Rings of the abdominal Muſcles; there then remains but one Remedy, and that is to extirpate or caſtrate the diſeaſed Teſticle by the Scalpel. But if the ſpermatic Cord is enlarged or varicoſe within the Abdomen, the Patient having a Pain in his Back or Loins, even when the Weight of the Teſticle is ſupported by a Sling, in that Caſe the Operation will be uſeleſs, and therefore muſt not be undertaken. In order to perform it, the Patient being ſecured, I begin an Inciſion with the Scalpel above the Rings of the abdominal Muſcles, and continue it through the adipoſe Membrane downward in proportion to the Size of the Teſticle, which being freed from the Scrotum, after making a Ligature upon the ſpermatic Cord a little below the abdominal Rings, it may then be cut off together with a good deal of the ſuperfluous part of the Scrotum, taking care to ſecure the larger Veſſels by Ligature, if there is danger of a profuſe Hæmorrhage. *Le Dran* indeed adviſes to make the Ligature only upon the ſpermatic Artery and Vein, and aſks for what reaſon the Ligature is made upon the Vas deferens and ſpermatic Nerves; ſince we know a Stricture upon ſuch Parts excites great Pain and Inflammation. Others again are afraid of cutting through the Blood-veſſels, when the Ligature is made upon them only; and therefore it is adviſable to make two Ligatures, one half an inch lower than the other, upon the ſpermatic Artery and Vein without the Nerves or Vas deferens, only ſecuring the Blood-veſſels from being cut through with the Ligature by the Interpoſition of ſome ſoft Lint, conſtringing the Ligature, and ſecuring it by the Surgeon's Knot, in which the thread is paſſed twice through the Loop; this done, the Teſticle may be cut off a little below the ſecond Ligature. Yet it muſt be owned, that in common Practice, Convulſions hardly ever follow from making the Ligature upon the whole ſpermatic Cord; and the Nerve is alſo interwove in ſuch a manner with the Veſſels, as to render it very difficult, if at all practicable, to free it from them.

Q. 235. What is the Nature and Treatment of a *Phymoſis?*

A. A Phy-

A. A Phymoſis is ſuch a Stricture of the Prepuce over the Glans Penis, that it cannot be denudated or drawn back, which confining Shankers and virulent Matter renders it neceſſary to be cut open in the venereal Diſeaſe. If then diſcutient Fomentations or Cataplaſms will not remove the Stricture, the Prepuce is to be extended forward, while the Glans is preſſed back, and then divided laterally either by the Sciſſars or Scalpel, ſlitting up to the very extremity at the neck of the Glans; after which a pretty copious Hæmorrhage uſually enſues, and ſhould not be ſuppreſſed, as it may ſerve to reduce the Inflammation and Tumor: but if this Hæmorrhage is much feared from the Weakneſs of the Patient, or other Circumſtances, the Inciſion is better made with the Scalpel on one ſide of the Prepuce, rather than above where the Veſſels are very large. If the Stricture has cauſed an incipient Gangrene in the Glans, I ſcarify to the quick, and apply an Infuſion of *theriaca in S. V. camph.*

Q. 236. What is the Nature and Treatment of a *Periphymoſis?*

A. This being the Reverſe of the former, is when the Prepuce turns back behind the

Glans, ſo that it cannot be brought forwards to cover the Glans. Some indeed have the Prepuce naturally turned back in this manner without any inconvenience: but when the Stricture hence ariſing is ſo great, as to obſtruct the Circulation in the Glans, and threaten a Gangrene, ſeveral ſmall Inciſions muſt be made by the Lancet in the Stricture longitudinally, as muſt be alſo done when the Prepuce is diſtended with watery Tumors called *Cryſtallines*; and then the Dreſſing may be concluded by fomenting with Diſcutients, as an Infuſion of *theriaca in S. V. camph.*

Q. 237. How do you remove venereal Warts from the Prepuce and Glans?

A. Theſe are commonly a ſort of fungous Fleſh of very ſpeedy Growth, and may be eaſily taken down by mild Eſcharotics, as *alum. uſt. merc. præcip. rub. &c.* mixed with a little digeſtive Ointment; or if they hang by a ſmall Neck, they may be taken off by the Scalpel.

Q. 238. How do you remove a Mortification in the Penis?

A. This is beſt done by introducing a ſilver Canula into the Urethra, then making a ſtrict Ligature with thread or ſilk upon the ſound part of the Penis immediately behind that which is ſphacelated, ſo as to compreſs the ſame cloſe to the Canula, keeping the Ligature tight till the mortified Part ſeparates from the reſt.

Q. 239. How do you treat an Incontinency of Urine in Males?

A. As this often proceeds from Weakneſs in old Age, a Palſy or Stone in the Bladder, incapable of Relief from internal Medicines, Surgeons have therefore contrived a ſmall Inſtrument with a Screw, called the *Yoke*, to compreſs the Urethra near the Neck of the Bladder, repreſented in *Tab.* III. *fig.* 7. which being lined with Velvet may be taken off and re-applied as there is occaſion, ſo as to make it fit eaſily upon the Part.

Q. 240. What are the Signs of the Stone in the Bladder?

A. They are (1.) A frequent Inclination to make water, followed with great Pain in the Glans, laſting two or three minutes, and ſometimes a Suppreſſion of Urine. (2.) A

Teneſmus, or fruitleſs Attempt to go to ſtool from the Irritation of the Stone upon the Rectum. (3.) Frequent Diſcharges of Mucus in the Urine, and ſometimes Blood, from the Irritation of the Stone upon the Coats of the Bladder itſelf. (4.) The Patient not being able to make water, but in a ſupine Poſture, and frequently perceiving the Senſe of a Weight or heavy Body moving in his Bladder, and itching in the Glans. But laſtly, (5.) As theſe may be all fallacious, the only ſure Sign is by ſearching with the Catheter, which affords the moſt certain Diagnoſis by the Noiſe and Reſiſtance to be perceived when it ſtrikes againſt the Stone.

Q. 241. How do you ſearch for the Stone?

A. The Patient being laid ſupine, I introduce the oiled Catheter, *Tab.* Y. *fig.* 2. into the Urethra with its convex Part towards the Abdomen, till I find the Extremity meet with ſome Reſiſtance in the Peritonæum; and then ſuddenly turning it round without violence with the concave part towards the Abdomen, I thruſt the end of it gently downward under the Os pubis, and then upward into the Bladder, raiſing the extremity by depreſſing the handle. But one not verſed in the proper Method of turning the Catheter, may better introduce it all together from the firſt, with the concave ſide towards the Abdomen; and if the extremity heſitates at the entrance into the Bladder, it may be forwarded into it by directing it with the finger, firſt introduced into the Rectum. The Catheter muſt be choſe in Size and Curvature agreeable to the Age of the Patient; but it may be much more eaſily introduced through the Urethra of the female Sex, which is much ſhorter, wider, and more direct. If the end of the Catheter in its courſe ſhould meet with ſome Reſiſtance from the Neck of the Bladder, or Caput gallinaginis, it muſt not be forced roughly forward, but rather drawn a little back, and urged on again through the middle of the Canal till it has entered the Bladder, when the End of it is to be directed towards every way, till its meeting with a hard ſonorous Body diſcovers that there is a Stone, the Largeneſs, Roughneſs and Compactneſs of which may be judged of by feeling with the end of the Inſtrument.

Q. 242. How many ways are there of cutting for the Stone, and which do you prefer?

A. The firſt and oldeſt Method deſcribed by *Celſus* is known by the Name of the *Apparatus minor* from the fewneſs of Inſtruments uſed in it; nothing more being required than to dip the middle finger in Oil, and introduce it into the Anus, while the right hand preſſing above the Os pubis upon the Bladder, ſo as to bring the Stone to its Neck, an Inciſion is then made with a Knife (*Tab.* I. *fig.* D.) in the left ſide of the Perinæum upon the Stone, which is next turned out through the Wound either with the Finger or a Scoop. Thus the ſame Parts were divided as at preſent in the lateral Operation, only we now uſe convenient Inſtruments to direct the Inciſion, and extract the Stone.—The *Apparatus major*, publiſhed by *Marianus* in 1524, is performed with a grooved Catheter or Staff, (*Tab.* Y. *fig.* 3.) oiled and introduced into the Bladder, and the convex or grooved Part being turned outwards preſſing on the left ſide of the Seam in the Perinæum, an Inciſion is begun immediately below the Scrotum, and continued downwards to within an inch of the Anus, and then bringing the Point of the Knife forwards in the Groove, a good part of the Bulb of the Urethra is divided. Then the Gorget

(*Tab.* Y. *fig.* 6.) is introduced, and after dilating the Urethra and Neck of the Bladder with the Forefinger, the Forceps (*Tab.* Y. *fig.* 10.) are introduced ſhut till they touch the Stone, when they are opened to take hold of the Stone, and extracted with a moderate force downwards towards the Rectum. —The *high Operation* publiſhed by *Peter Francus* in 1561, after being diſcontinued from his time, was revived here at *London* in 1719 by Mr. *John Douglaſs.* After diſpoſing the Patient, the Bladder is diſtended with ten or twelve ounces of Barley-water injected by a Catheter, the Penis being in the mean time preſſed cloſe when the Inſtrument is withdrawn, to prevent the Return of the Liquor; and then an Inciſion is made with a round-edged Knife, to the length of about four inches, between the Recti and pyramidal Muſcles through the adipoſe Membrane to the Bladder; after this, an Inciſion is made into the Bladder itſelf with a crooked Scalpel, carried a little under the Os pubis, introducing the Fore-finger of the left Hand immediately while the Water is running out, in order to direct the Forceps to the Stone. But this Method ſoon loſt its Reputation from the many bad Conſequences which attend it; partly from wounding the Peritonæum, and injuring its Contents by the extravaſated Urine, and partly from the Urine inſinuating into the cellular Membrane, whence incurable Fiſtulæ, Excoriations, *&c.* —The *lateral Operation*, which is that now commonly uſed, was firſt put in practice by *Fryer James* at *Paris* in 1697, and is at preſent performed with ſome Improvement by Mr. *Cheſelden*, and moſt others in the following manner. The Patient being laid on a Table, with his Hands and Feet tied, and the Staff (*Tab.* Y. *fig.* 3, 4.) paſſed as in the old way, let your Aſſiſtant hold it a little ſlanting on one ſide, ſo that the Direction of it may run exactly through the middle of the left Erector Penis and Accelerator Urinæ Muſcles; then make your Inciſion through the Skin and Fat very large, beginning on one ſide of the Seam in Perinæo, a little above the place wounded in the old way, and finiſhing a little below the Anus, between it and the Tuberoſity of the Iſchium. This Wound muſt be carried on deeper between the Muſcles, till the Proſtate can be felt, when ſearching for the Staff, and fixing it properly if it has ſlipt, you muſt turn the edge of the Knife upwards, and cut the whole length of that Gland from within outwards, at the ſame time puſhing down the Rectum with a finger or two of the left hand, by which Precautions the Gut will always eſcape wounding; after which the Operation finiſhes nearly in the ſame manner with the greater Apparatus; that is, by ſliding the Gorget (*Tab.* Y. *fig.* 3, 4.) along the Groove of the Staff into the Bladder, and dilating the Parts with the Fore-finger, the Forceps (*Tab.* Y. *fig.* 10.) are introduced ſhut till they touch the Stone, which is then graſped by a moderate force, and extracted downward towards the Rectum. In this Method, the remarkable Parts wounded by the Knife are the Muſculus tranſverſalis Penis, Levator Ani, and proſtate Gland. In the old way, the Urethra only is wounded about two inches on this ſide the Proſtate; and the Inſtruments are forced through the reſt of the Paſſage, which is compoſed of the bulbous part of the Urethra, the membranous part of the Urethra, the Neck of the Bladder and proſtate Gland. The chief Cautions neceſſary are to avoid wounding the Rectum, and to reſtrain the Hæmorrhage by Ligature with Needle and thread, if any large Veſſels are divided in the external Wound before the Extraction of the Stone. If after the Operation the Veſſels of the Proſtate bleed, the Hæmorrhage may be ſuppreſſed by applying Lint dipped in *alcohol vini*, or ſome other ſtiptic Liquor; or if there is no Hæmorrhage, a Pledget of dry Lint ſpread with ſome mild Digeſtive will ſuffice. If the Symptoms of a violent Inflammation enſue, and the Pains increaſe a few hours after the Operation, recourſe muſt be had to bleeding, emollient Clyſters, with a Fomentation applied externally in a Hog's Bladder, *&c.* If the Pulſe is low, Bliſters are often uſeful; the Dreſſings muſt be retained by a looſe Bandage; and if the Wound is foul, it may be deterged by dreſſing with Lint dipped in Turpentine or its Oil made warm, in which has been diſſolved ſome Verdigreaſe; and when the Lips of the Wound appear clean, they may be healed by dreſſing with ſome ſoft Digeſtive or dry Lint only, applied ſo as not to over-compreſs the growing Surface, which by ſuch Preſſure might be render'd callous. The Union of the Lips may be alſo much expedited by retaining them together by the twiſted Suture (*Tab.* C. *fig.* 8 and 9.)

Q. 243. When and how do you perform the *Paracenteſis* of the Bladder?

A. The Paracenteſis or Puncture of the Bladder is made with a Trochar (*Tab.* T. *fig.* 10.) either immediately above the Os pubis betwixt the pyramidal Muſcles, or in that part of the Perinæum which is cut in the lateral Operation for the Stone, in order to diſcharge the Urine when it cannot be drawn off by the Catheter, the Patient's Life being in the utmoſt danger. For it may be impoſſible to paſs the Catheter, either from the violent Inflammation, Cicatrix, Tubercle, Stricture, or Scirrhoſity, or even a Stone wedged into the Neck of the Bladder. There is no great danger of wounding the other ſide of the Bladder in this Caſe with the Point of the Trochar, the Diſtenſion of it being ſo very great; but of the two, the Paracenteſis of the Bladder above the Os pubis is the eaſieſt, and appears from Practice to be the ſafeſt Method, except in ſome Caſes, as when a Callus, Scirrhus, or large Stone ſtops up the Neck of the Bladder, then it would be better to make the Puncture in Perinæo, becauſe then the Opening may be afterwards dilated either by the Knife or Sponge-tents, as may be found neceſſary, ſo as to remove the Obſtacle. If a callous Fiſtula remains in Perinæo from this or any other Cauſe, in order to cure it, the Calloſity muſt be firſt removed from the Wound either by the Scalpel or eſcharotic Medicines, as the application of Bliſter-Plaſters, white or red Precipitate, with *linimentum Arcei*, *&c.* taking care to preſerve the Lips together when deterged either by Suture or Compreſs, and to prevent the Urine from paſſing through them, by giving it a free Vent through a flexible Catheter left in the Bladder and Urethra, which Method has happily ſucceeded in ſeveral Inſtances.

Q. 244. How do you extract a *Calculus* in the Urethra?

A. In this deplorable Caſe, if the Stone is not over-large, one may endeavour firſt to remove it by injecting Oil into the Urethra, and afterwards by inflating it with a Blow-pipe as much as poſſible, puſhing the Calculus forward with the fingers; but if the Stone is ſo large, rough, and ſeated ſo near to the Neck of the Bladder, that one cannot reaſonably expect this Method to ſucceed, the beſt way is to make an Inciſion through the Urethra upon the Stone, ſufficient to give it a Paſſage outward, making the Inciſion laterally in the Urethra; and if a ſilver Tube, made in the manner of a flexible Catheter, is afterwards introduced and left in the Urethra, ſo as to diſcharge the Urine without ſuffering it to penetrate the wounded Parts, the Cure will be much expedited, provided Inflammation is guarded againſt, and the Wound may heal in twenty-four hours. If the Inciſion be made in the upper part of the Urethra, after freeing it as much as poſſible from the Corpus cavernoſum Penis, when the Stone is extracted, the Orifice will be compreſſed by the Corpus cavernoſum, and much ſooner healed.

Q. 245. How do you extract the Stone in Women?

A. The Urethra is ſo ſhort, and capable of ſo great Dilatation in the female Sex, that there is hardly ever any occaſion to cut them for extracting the Stone, inſomuch that we have many Inſtances of Stones diſcharged without cutting, which have even equalled the ſize of Hen and Geeſe Eggs. They are to be placed as in cutting for the Stone, and after introducing a ſtrait Director into the Bladder through the Urethra, a Gorget is tranſmitted through the Director, and thro' the Gorget is conveyed a pair of Forceps to extract the Stone, which may be done without cutting, except when it is extremely large; in which Caſe it is more adviſable to make an Inciſion laterally on each ſide the Urethra, without injuring the Vagina, rather than to force a Laceration of it. Sometimes if the Stone is of a ſoft Texture, it may be firſt broke by the Forceps, and extracted in Fragments, when it is too large to be taken out entire. But as an incurable Incontinency of the Urine frequently attends this Method of extracting the Stone, ſome prefer the making an Inciſion through the upper part of the Vagina into the Bladder, extracting the Stone that way; and thus *Hildamus* ſucceeded, *Cent.* 1. *Obſ.* 68. *Cent.* 3. *Obſ.* 69.

Q. 246. How do you treat a *Prolapſus Uteri*, or bearing down of the Womb and Vagina?

A. When the Os tincæ ſubſides a conſiderable way into the Vagina, it is called a bearing down of the Uterus; but if it appears externally out of the Vagina, it is termed a *Prolapſus Uteri*, and may frequently happen from a Relaxation and difficult Labours.

Whether the Uterus be prolapſed or inverted, if it be not timely reduced into its proper Situation, it ſoon becomes either gangrenous or cancerous from the Stricture, or from the cold Air: it ſhould therefore be returned as ſoon as poſſible, after being fomented or treated with dry aromatic Fumes; and when reduced, it muſt be ſuſtained by a Peſſory made of Cork cut in the ſhape of a Ring, and covered over with Wax, and of ſuch a ſize as will not permit it to ſubſide, being almoſt twice the Diameter of the Vagina. Afterwards dry Fumes of Amber, Benjamin, Maſtic, *&c.* may be conveyed by a Funnel, or a corroborating Injection may be uſed of *aq. calc. & S. V. p. e.*; to which may be added as much Smith's Forge-water, *&c.* provided there is no diſpoſition to a cancerous Diſorder. An Infuſion of Granate-peels or Oak-bark in ſome Chalybeat Water may be alſo uſed as an Injection, and the *Peruvian* Bark may be given internally; and the ſame Means will be likewiſe effectual in a Prolapſus of the Vagina.

Q. 247. How do you treat a *Prolapſus Ani?*

A. The Rectum is frequently relaxed and ſwelled ſo much with the Piles after difficult Labours or Coſtiveneſs, *&c.* as to appear inverted outward, ſometimes near three or four Inches; and in this Caſe it ought to be immediately returned after fomenting it with warm red Wine, and its Relapſe muſt be prevented by the application of thick Compreſſes retained by the T Bandage. It may be likewiſe convenient to convey the dry Fumes before-mentioned for the Prolapſus Uteri through a Funnel into the Anus; upon which may be ſprinkled likewiſe ſome fine Powder of Starch, with a little *Japan* Earth and Dragon's Blood. But if it proceeds from an Inflammation, this Powder will be better omitted, and the Diſorder ſhould be rather treated by Bleeding, Abſtinence, and cooling Medicines.

Q. 248. How do you treat the bleeding and the blind Piles, with other Tubercles of the Anus?

A. The Piles we know are Tubercles of the Anus, of various Sizes, like Peas, Grapes, Walnuts or Eggs, formed by a Diſtenſion of the hæmorrhoidal Veſſels with Blood, appearing of a livid Colour, and extremely painful; and theſe are called the blind Piles; but if they break and diſcharge Blood, they are termed the bleeding Piles, frequently appearing in plethoric and coſtive People, eſpecially in Women with Child. The blind Piles, which are very large and painful, may be removed by Ligature, which will cauſe them to ſeparate in three or four days time; the Inflammation may be taken off with *ung. nutrit.* after having firſt applied Leaches to the moſt turgid Veins, or elſe opened them by the Lancet, compleating the dreſſing with ſome Lint, Compreſſes, and the T Bandage. In the mean time the Patient ſhould be bled in the Arm, and treated with a Decoction of the *Chelidonium minus*, or *Scrophularia minor* internally, and a Cataplaſm of the Herb externally. In the bleeding Piles, if the Hæmorrhage is not profuſe, it ought rather to be encouraged than ſuppreſſed; but if the Patient's Weakneſs or Habit requires, it may be reſtrained by making Ligatures upon the moſt conſiderable with a Needle and thread, cutting off the ſuperfluous Parts, and the application of *alcohol vini* as a Stiptic. In the ſame manner likewiſe may be removed other Excreſcences of the Anus, whether under the Denomination of *Condyloma*, *Criſta*, *Ficus* or *Fungus*.

Q. 249. What is the Nature and Treatment of *Fiſtulæ* in the *Anus?*

A. Fiſtulæ, whether in the Anus or any other Part, are callous Ulcers, as we before obſerved, generally proceeding from an Abſceſs; but both Abſceſſes and Ulcers without Calloſity, when ſeated in this Part, are termed *Fiſtulæ*. Theſe Fiſtulæ are of three kinds; ſome are critical Abſceſſes formed in the Fat which inveſts the Rectum; others proceed from the Piles ulcerating, and others again ariſe from venereal Cauſes; but from whatever Cauſe the Fiſtula proceeds, it muſt be laid open externally as much as poſſible throughout its whole Extent, either by the Sciſſars or Scalpel; or if the Fiſtula runs up by the ſide of the Inteſtine, the Gut muſt be ſlit up the whole Extent of the Sinus, whether that perforates the Inteſtine or not, that an opportunity may be given for the application of proper Remedies to the very Fundus of the Fiſtula. But it will not be barely ſufficient to lay the Fiſtula open into the Gut when there is a conſiderable Calloſity, but it will be likewiſe neceſſary to cut off all the callous Parts as much as poſſible, which is much better than to keep the Patient in continual Pain by the uſe of Eſcharotics. If the Sinus's are too ſmall to admit the Legs of the Sciſſars, they muſt be firſt dilated with Sponge-tents; nor is there occaſion for any other Inſtrument except the Knife and Director, which of the two cuts eaſier than the Sciſſars, if it were but as eaſy to be managed; nor is there any occaſion to be afraid of dividing the Sphincter of the Rectum, as ſome have imagined, ſince daily Experience aſſures us it may be done without any conſequent Palſy, or Incontinency of the Fæces. The Abſceſs or Fiſtula in Perinæo ſpreading towards the Anus, commonly proceeds from a Gonorrhæa affecting the proſtate Gland firſt, but frequently extends with Sinus's both into the Rectum and Bladder itſelf. Here alſo, as before, the callous Parts muſt be cut out, and the Cure forwarded by a ſlight ſpitting, or at leaſt with a proper uſe of Mercurials both externally and internally; and when the Malignity is removed, and the Parts properly deterged, the reſt of the Cure may be conducted as in other Abſceſſes. In all Fiſtulæ of theſe Parts one ought to be particularly careful not to neglect the uſe of Mercurials, when they proceed from a venereal Cauſe, without which little good can be done. The Dreſſings may be made with doſſils of Lint ſpread with digeſtive Oinment, and ſecured with threads, but not preſſed in ſo tight as to render the Parts callous; and theſe are to be retained by Compreſs and the T Bandage of *Heliodorus*, which conſiſts of two pieces of Linen ſewed together in the ſhape of a T, the one being faſtened round the Waiſt, and the other brought up betwixt the Legs over the Dreſſings, which will be kept the tighter upon the Parts, if the T Bandage is aſſiſted by a Scapulary faſtened to it before and behind, as in *Tab.* S. *fig.* 9.

Q. 250. What do you apprehend to be the Nature of the venereal Infection, and how do you diſtinguiſh the Diſeaſes ariſing from it?

A. As it ſeems impracticable to diſcover the Nature of this *Virus à priori* from the mechanical Figure, Texture, and Combination of its Particles, with the relation they bear to the Parts of the Animal, Solids and Fluids, (in the ſame manner as we are unable thus to diſcover the Nature of the varicolous Contagion, or that from the Bite of mad Animals); therefore in theſe difficult Caſes we can only determine the Nature of the Poiſon *à poſteriori*, from its Effects, which appear in the ſolid and fluid Parts of the animal Body by Experiment or Obſervation. As the Fluids have a leſs Coheſion, and are more eaſily affected than the Solids, therefore the firſt Action of this, as well as of the variolous and hydrophobous Contagion, ſeems to be primarily upon the Fluids, and particularly thoſe which are the moſt viſcid, and have the leaſt progreſſive Motion in the Body; namely, the Fat, the Lymph, and mucous or ſebaceous Juices of the Glands: for as the variolous Matter produces various Diſorders by its greater Activity upon that Fluid which moves the faſteſt in the Body, namely, the red Blood, either by vitiating the Texture of that Fluid, or irritating the Veſſels through which it is moved; this venereal Virus, on the contrary, being more ſluggiſh, is diſpoſed only to operate upon thoſe Fluids, whoſe ſlow Motion and Tenacity of Parts will not only embarraſs or confine, but alſo give the Contagion an Opportunity to act as a Ferment, by diſſolving and combining the natural and healthy Texture, of the Juices firſt, and then of the Solids, by means of thoſe Juices. It is not neceſſary for us to enquire into the Manner how it firſt acts in vitiating the Fluids, but it is ſufficient to direct us to the proper Method of Cure, if we are acquainted with its primary Effects which it produces obvious to the Senſes. But if we may be allowed to give our Opinion, as the Matter of this, as well as of the variolous and hydrophobous Contagion is of animal Original, they ſeem to produce their Effects by an Evolution and new Modification of the ſaline Parts in the animal Fluids, which having the greateſt Power of Attraction, exert the greateſt Force in producing ſimilar Changes: but the Size, Figure, and particular Nature of theſe Salts in the ſeveral Poiſons before-mentioned, ſeem to be in each of them *ſui generis*, of a particular Nature, and not reducible to any known Claſs. *Aſtruc* indeed thinks the Nature of theſe Salts to be acid, becauſe their immediate Effects are an Inſpiſſation and Obſtruction of the Fluids, *&c.* but it may as well produce thoſe Effects, as a neutral or alcaline Salt particularly modified; which ſeems the more probable, if we conſider that all Acids are either of mineral or vegetable Origin, and the moſt remote from animal Nature. The variolous Poiſon indeed is ſubtle enough to be communicated by Effluvia; but the venereal Contagion is of ſo groſs a Nature, that it requires an immediate Contact to mix its Parts with the Fluids, and vitiate their Texture. Whenever then a Particle of this Contagion is communicated from the Body of an infected Perſon to one that is ſound, either by Contact of the Parts of Generation, by ſucking, kiſſing, or mixing their Saliva, or any other way, it begins firſt to ſhew its Effects upon the Part to which it is communicated ſooner or later, according to the different Nature of the Part and its Juices, with the Strength or Quantity of the Contagion itſelf, and the Patient's Habit and Courſe of Life. Here, that is, in the Part, by Inſpiſſation of the Fluids, and inducing an Acrimony ſimilar to that of itſelf, the Infection firſt appears by a ſlight Inflammation, which by degrees ulcerates, ſpreads, and affords a particular kind of Matter, of a greeniſh yellow Colour, proving inflexible to the common Medicines uſed in other Ulcerations.

Venereal Diſeaſes may be therefore diſtinguiſhed into topical, where the Matter being lately received, is as yet only confined to the Part primarily affected; and univerſal or confirmed, where the Matter has ſpread throughout the whole, or the greateſt Part of the Habit in general. Hence it appears,

that

that the Diſeaſe may be defined in general a contagious Inflammation and Ulceration of a particular Kind, either throughout the whole Habit, or in ſome particular Part; confined to thoſe Juices which have the leaſt Motion, namely, the Fat, lymphatic, glandulous and mucous Juices. And hence we are naturally led to treat the Diſorder as an Inflammation at firſt; but afterwards to have a particular Regard to the Virus or Contagion to be expelled from the Habit, or Part itſelf affected. However, it has been cuſtomary to term the Diſorder a Pox, whenever it appears in any other Part but the Urethra; in which laſt Caſe, namely, as long as the Diſorder continues confined to the Urethra, it is termed a Gonorrhæa or Clap.

Q. 251. What is the proper Nature, and how many Kinds are there of a virulent *Gonorrhæa* or *Clap?*

A. This, from what has been ſaid before, appears to be an Inflammation and Ulceration in the Urethra, attended with a ſcalding of Urine, and more or leſs of a purulent Running. For the Membrane lining the internal Surface of the Urethra is nervous, very ſenſible, and replete with many ſmall Blood-veſſels; among which are interſperſed Lacunæ, or ſmall Ducts, diſcharging a mucous Humour, and opening obliquely with their Orifices pointing outward from the Bladder towards the Perforation of the Glans. The firſt, largeſt, and moſt remarkable Set of theſe Lacunæ or mucous Ducts are ſeated a little behind the Glans; two of them being more conſiderable than the reſt about the Frenulum: and this is the firſt Seat of the Gonorrhæa, when the contagious Matter being drawn up in a direct Courſe into theſe Lacunæ, at the time when the Parts grow flaccid, it is there embarraſſed by the viſcid Humour, which is thus by degrees corrupted into the ſame Nature with the firſt contagious Matter. As it becomes more acrimonious, it irritates and inflames this ſenſible Membrane, where acting as a Stimulus, it increaſes the Diſcharge of the mucilaginous Liquor from the Lacunæ outward into the Urethra, which in a natural State it lubricates and defends from the Acrimony of the Urine; but in this inflamed State the nervous Fibres are ſo ſtretched and denudated of their defending Mucus, that only the Acrimony of the Urine as it paſſes through, excites more or leſs in proportion an intolerable burning

ing Pain. The Matter thus diſcharged from the Lacunæ by a Preſſure continued from behind the Neck of the Glans forward, tho' at its firſt Secretion it was perfectly pellucid, does, by ſtagnating with the warmth of the Part and Action of the Virus, ſoon corrupt into a greaſy ſort of Matter of a greeniſh yellow Colour; whereas naturally, before the Mucus is thus corrupted, it is clear, ropy and viſcid, drawing out into threads. Hence we have a Sign whereby to diſtinguiſh when the Virulency of the Matter is gone off; namely, when the Matter diſcharged begins to appear ropy and clear without a greeniſh purulent Colour; for then it denotes that the virulent Particles lodged in the Lacunæ are diſcharged by the Flux outward. Hence therefore this Flux is to be promoted for ſome time, and not ſtopped by aſtringent Injections; for if the Lacunæ are contracted by ſuch Injections, and the Matter confined and repelled through the adjacent lymphatic Veſſels, it will paſs on by the ſerous Veins to the next adjacent lymphatic Glands, namely, thoſe of the Groins (or elſe to the Teſticle) where acting as before, it will excite an inflammatory Tumor, called a *Bubo*; or elſe producing Obſtructions in the lymphatic Veſſels and cellular Membrane, which lie immediately under the Cuticle of the Glans and Prepuce, they will by degrees turn to ſmall Ulcerations called *Shankers.* A Running ought therefore to be promoted for ſome time, in order to throw out the Matter received, and prevent it from ſpreading into other Parts.—The next or ſecond Seat of the Gonorrhæa is higher up in the Urethra towards the Bulb in the cellular Membrane and Ducts of *Cowper*'s Glands, which are ulcerated in the ſame manner as before; only here the Diſcharge is greater, the Inflammation and Symptoms more violent, and the Cure more difficult, as it is more out of the way of the Action of deterging and ſtimulating Injections, which are highly proper in theſe Caſes not to ſtop up, but to cleanſe and promote the Running by their gentle Stimulus.—The third and worſt Species of a Gonorrhæa or Clap, is when the Matter takes place in the Ducts of the proſtate Gland at the Neck of the Bladder, and Inſertion of the Ducts of the ſeminal Veſicles, which being ſometimes ulcerated and deſtroyed, leaves behind a true, ſimple, and incurable Gonorrhæa after the Patient is cured of the venereal Infection; and at laſt reduces him by the inceſſant Diſcharge, till he periſhes of a Tabes dorſalis, or Maraſmus of the whole Habit. As this laſt Kind is the worſt and moſt difficult to cure, ſo it luckily happens to be the leaſt frequent in Practice. But both this and the ſecond Species are frequently the Conſequence of the firſt, the Matter ſpreading ſucceſſively higher up into the Urethra through neglect of proper Remedies, or from repeated Coitions (frequently even with Women known to be infected) during the time of the Gonorrhæa. In the ſecond Species, the ſmall Glands diſperſed along the Urethra, after being inflamed, turn ſcirrhous, and leave thoſe Knots or Indurations, which are as difficult to remove as they are frequently obſerved.

Q. 252. How do you treat a Gonorrhæa in order for its Cure?

A. From conſidering the Nature of the Diſorder, we are directed to the following Intentions: 1. To diſcharge the Virulency, and prevent the ſpreading of the Contagion. 2. To abate or remove the Inflammation; and laſtly, 3. To heal up the Ulceration. Therefore as the Diſorder is here topical only, there is little or no occaſion for internal Medicines, only to keep the Inflammation under by a cooling Purge with Salts and Manna or Rhubarb, bleeding when neceſſary in full Habits, and in the Summer-time, joined with Abſtinence and a plentiful uſe of thin Liquors. Not that any thing of the Virus is carried off by purging, only it is neceſſary to give a Stimulus to the Bowels, that they may not have an opportunity of abſorbing much of the crude Chyle, which being the groſſeſt Fluid circulating in the Body, is the moſt apt to increaſe Obſtruction and Inflammation not only here, but alſo in any other inflammatory Caſe. Therefore if the Patient can be enjoined to Abſtinence and thin Liquors, there will be no occaſion for Purges, which many injudiciouſly give ſo as to ſhock and waſte the whole Habit by their great Strength and repeated Doſes, more eſpecially of Calomel; of which laſt there is not occaſion to give ſo much as a ſingle grain internally, or of any other Mercurial in the two firſt Species of the Gonorrhæa, which are always rather exaſperated by internal Mercurials inflaming the Habit. But the moſt ſpeedy, ſafe, and effectual Remedies in this Caſe, next to a cooling Regimen and Medicines, are repeated warm bathing of the Parts, with the uſe of deterging Injections firſt, and then of healing ones. I have ſeveral times obſerved the Truth of what is juſtly affirmed by *Boerhaave*[a] and *Hoffman*[b], namely, "that a Gonorrhæa or Shankers too ſoon dry'd up by Aſtringents before the Virus is run off end in a Pox, if the Caſe is inveterate, and the Inflammation neglected." And the latter obſerves, "that Shankers dry'd up before the venereal Virus is run off turn to a Gonorrhæa, and a Gonorrhæa too ſoon ſtopp'd turns to Bubo's; but Bubo's repell'd turn again to a Running, or a confirmed Lues." Mercury inflames, and is miſchievous in the beginning of Claps, as it is no Specific to the Virus, but removes its Effects by diſſolving the Tenacity of the Fluids, and by evacuating them with the Virus; but then this laſt muſt be underſtood of the confirmed Lues, or where there are Shankers, Bubo's, Scabies, *&c.*

The deterging Injections I have frequently known to cure the firſt Gonorrhæa in one, two, or three days; and the healing or aſtringent Injections are convenient to be uſed only when the Running is a ſimple Gleet, and perfectly pellucid, after the former have been continued ſome time. The only Objection to this Method is the making too ſpeedy Cures, for which the Patient may think he pays too high in proportion to the Attendance and Medicines uſed; but this Opinion can prevail only with the Covetous and Inconſiderate. In the laſt Species of the Gonorrhæa, the Cure it muſt be owned is much more difficult, as it is more out of the reach of the Medicine, and the Ulceration ſometimes ſpreading cauſes an Abſceſs in Perinæo after a conſiderable Inflammation and Diſtenſion about the Neck of the Bladder. Here therefore it will be proper to give the alterative mercurial Pills, to dilute plentifully with thin Liquors, and to uſe ſuch things as deterge the urinary Paſſages, particularly the following Drops, namely, the *tinctura cantharidum ad pharmac. Edin.* gradually increaſed to a hundred drops more or leſs, two or three times in a day. A Swelling of the inguinal Glands, termed a Bubo, is to be diſperſed either by bleeding and mercurial Unction with lenient Purges; or if it cannot be diſperſed, it muſt be brought to Suppuration with a Galbanum Plaſter; and then opening it either by Inciſion or the Cauſtic, it muſt be deterged and healed. An Inflammation and Tumor either of the Penis or

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[a] *Vide* Præf. ad Scriptor. de morb. Gall.

[b] Opera, Vol. I. p. 353.

Teſticle muſt be removed by bleeding, with the application of an emollient diſcutient Cataplaſm, and the Weight of the Teſticle is to be ſupported by a Bag-truſs. Shankers are to be removed by fumigating with Cinnabar, and by the uſe of alterative Mercurials internally.

Q. 253. What is the proper Nature and Treatment of a Pox?

A. This, as we obſerved before, is either topical, when the Infection is confined only to ſome particular Part of the Body; or univerſal, when it has ſpread throughout the whole Habit. Thus the Lues may be contracted without any preceding Gonorrhæa, if the contagious Matter is abſorbed through the Skin of the Prepuce, without ever entering the Urethra; whence often ariſes Shankers, Buboes, and ſometimes a Scabies, from the Matter ſpreading through the cellular Membrane and lymphatic Veſſels under the Skin. We may commodiouſly divide the venereal Lues into three Kinds; the firſt and mildeſt of which is when Shankers, Buboes, and a cutaneous Scabies attend; and this Kind may be cured without a Salivation by Mercurials rendered alterative with Camphire and

Diaphoretics. But when the Diſorder has ſpread not only through the Fabric of the Panniculus adipoſus, but likewiſe has extended itſelf therewith into the Bones, ſo as to produce Nodes, nocturnal Pains, internal Ulcers, *&c.* in that Caſe nothing leſs than a ſpitting raiſed by Mercury will ſuffice, and that even in a degree proportionable to the Diſeaſe itſelf. The third and laſt Kind of the Diſeaſe is when the forementioned Symptoms are likewiſe attended with a Cachexy, and great Weakneſs of the vital Powers; in which Caſe Mercury does not exert its due Action upon the Fluids in the ſmaller Veſſels for want of a due Strength in them; and in theſe Caſes, though Salivation ſhould be raiſed with difficulty, and continued for ſome time, yet the Diſeaſe will not be cured but by ſweating, and drinking large quantities of the Decoction of Guaiacum made very ſtrong, and drank to the quantity of three Pints every day before the Patient is put into the Stove, which is to be practiſed for about a fortnight, ſweating him, according to the Patient's Strength, from a quarter to half an hour, firſt in the Stove, and afterwards for half an hour or an hour longer in Bed. Thus the Juices are more intimately reſolved, the

Lymph attenuated, and the morbid, fat, or oily Parts waſhed out more effectually than by a Salivation itſelf, as is ſufficiently apparent from Experiment; for when a ſpitting has been attempted to be raiſed by Mercury, after the ſweating Method has been uſed, it has been found impracticable. The beſt and ſafeſt Method of raiſing a ſpitting is doubtleſs by Unction, rubbing in about as much of the Ointment as contains a ſcruple of the Mercury every day; or, in precarious Habits, every other day, upon the Limbs and Back, or upon the Limbs only; taking care to watch the Mouth and Symptoms after the ſecond Unction, which muſt be repeated to the third, fourth, or fifth time, if the Symptoms of a ſpitting do not ariſe before; ſuch as a Heavineſs and Pain in the Head, a quick and full Pulſe, Stupor of the Teeth, Redneſs and Inflammation of the ſalival Ducts in the Mouth, with a Swelling of the Glands, Tongue and Cheeks, with a ſtinking Breath, and frequent ſlavering. When the ſpitting comes on, the Unction muſt be laid aſide; or if the Mercury acts too ſuddenly, and with too great Violence upon the Head, it may be checked by a lenient Purgative, or by bleeding at the Arm. If it inclines to run off by a Diara Diarrhæa or a Diabetes, the Body muſt be kept warm or well covered, and Opiates with Diaphoretics uſed internally; ſupplying the Patient with plenty of Ptiſan, or thin chicken or veal Broths. Thus is the ſpitting to be kept up to about the quantity of three or four pints every day of twenty-fours for about a fortnight or three weeks; or if it does not ariſe to that quantity in a day, more Unction muſt be rubbed in. In the mean time, if it has a Tendency, as we obſerved before, to run off by a Diarrhæa, it muſt be checked by Opiates, burnt Claret, and Diaphoretics. If the Mouth and Fauces are much ſwelled and inflamed, or painful, they muſt be frequently waſhed with a Gargle of the common Emulſion, with Liquoriſh and a little *ſpiritus nitri dulcis.* But in cachectic Diſpoſitions, with a ſcrophulous or ſcorbutic Acrimony of the Juices, the ſweating Method, with the Decoction of Guaiacum, as before-mentioned, will be moſt convenient. But for a more particular Account of theſe Matters, the Reader may conſult *Aſtruc* in his *Treatiſe of Venereal Diſeaſes,* who is the lateſt and fulleſt Writer upon the Subject.

Place this Leaf after Fol. 271.

N° 1. Clyſma purgans, refrigerans revulſivum.

℞ *Fol. Senn.* ℥j. *Flor. Cham.* ℥ſs. *decoque in aq. font.* ℥x. *colaturæ adde ſalis gemmæ* ʒvj. *M. F. Enema.*

N° 2. Fotus antiſepticus diſcutiens.

℞ *Flor. Sambuc. Chamæm. contuſ.* āā *M. j.*
Theriac. Lond. ℥j.
Salis Ammon. crud. ʒvj.
Coquantur in vin. alb. acid. ℔j.

N° 3. Cataplaſma ſuppurans.

℞ *Rad. Lil. alb. vel alth.* ℥iv. *Ficuum ping.* ℥j. *coctis in aquâ & contuſis, adde cepar. crud. contuſ.* ʒvj. *Galb. in vitel. ov. ſolut.* ℥ſs. *Ol. Cham. infuſ.* ℥ij. *Farin. ſem. Lini q. ſ. M.*

N° 4. Cataplaſma diſcutiens.

℞ *Rad. Bryon.* ℥ij. *Irid. noſt.* ℥j. *Flor. Cham. Sambuc.* āā ℥ſs. *Aq. font. q. ſ. Coque ad teneritudinem & magmati contuſo adde Gum. Ammon. in acet. ſolut.* ℥ſs. *Salis Ammon. crud.* ʒij. *Theriac.* ℥j. *M.*

N° 5. Pulvis (Angelicus dictus) Eſcharoticus, digeſtivus.

℞ *Alum uſt. Merc. præcip. rub.* āā ʒj. *M.*

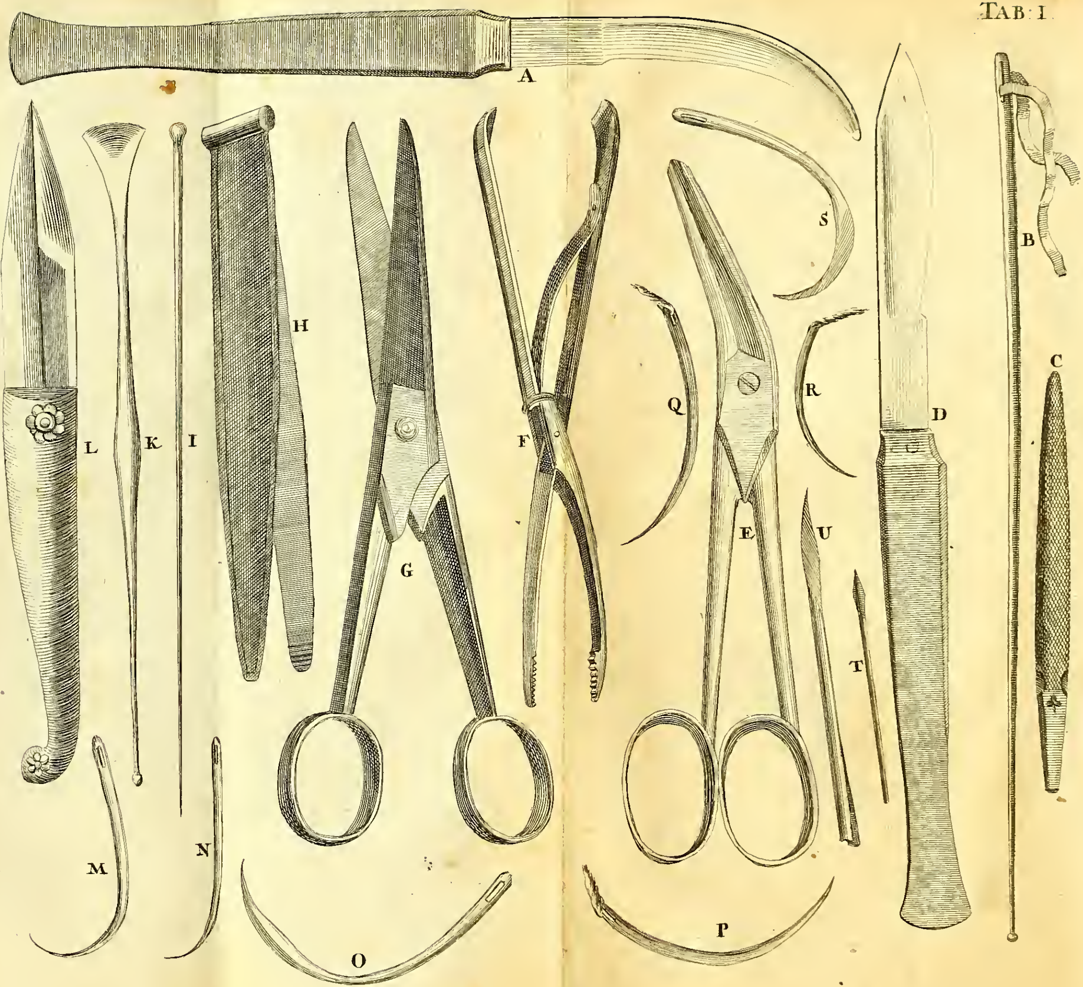
N° 6.

N° 6. Balſamum Vulnerar. epulot. *Freyeri.*

℞ *Balſ. Tolut. vet. Coloph. nig.* āā ℥jſs. *Mellis communis recentis* ℥j. *Gum. Sarcocol. Maſtich. Croci* āā ʒj. —— *Myrrhæ Benz.* āā ʒſs. *Sp. vini Gall.* ℥xij. *Infunde ſimul in balneo mariæ ut fiat ope caloris ſolutio ſ. a. Coletur ad uſum.*

N° 7. Balſ. calidum deterſivum.

℞ *Sumit. Sabin. Centaur. min.* āā ʒij. *Gum. Myrrhæ* ʒiij. *Terebinth. Venet.* ℥ij. *Sp. Vin. Gal.* ℥xij. *Præparetur ad uſum ut prius.*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An EXPLANATION of the Figures in the Copper-Plates, which are added to illuſtrate the ſeveral Operations before deſcribed.

An Explanation of Tab. I.

A REpreſents a crooked *Scalpel* with an obtuſe point or button for the operation of the Bubonocele, to avoid injuring the inteſtines; ſerving alſo for enlarging an opening into the thorax, without wounding the lungs or intercoſtal blood-veſſels. The handle of this and all other knives ſhould be made of the lighteſt wood that can be procured, that the reſiſtance made to the blade in dividing the parts may be better perceived by the hand.

B Denotes a common ſilver *Probe* with a globular point, and an eye armed with a ligature or ſkain of ſilk, which being ſpread with ſome balſam, or other medicines, may by this means be conveyed thro' a gun-ſhot, or other pervious Wound or Ulcer, which has two openings like a ſeton. Of itſelf it ſerves to examine the extent and courſe of wounds, ulcers, *&c.* for which reaſon it is form'd of the pureſt ſilver, that it may be eaſily flexible into any poſture as may be judged moſt convenient. Some of theſe Probes are made with an half eye, and with a triangular ſharp point, that lint may be fixed in the former, or wound about the latter, and be thereby convey'd, either dry or armed with proper medicines, to the bottom of an ulcer or hollow part, *&c.*

C A ſmall *File* for levelling the aſperities of the teeth or their ſtumps, when they wound or irritate the tongue ſo as ſometimes to threaten a cancer.

D Repreſents a round-edged *Knife*, fixed in a light wooden handle, and ſerving to cut for the Stone, and for moſt of the other operations which require a knife.

E A pair of crooked or *Probe-Sciſſars*, uſed chiefly in a Fiſtula of the Anus, and to divide the ſoft parts as they follow the probe: but as they pinch or contuſe the parts they divide, the knife is therefore much preferable where it can be applied.

F Exhibits a pair of *Spring-forceps*, with pickers at one end for extracting ſplinters, thorns, *&c.* and with teeth at the other end for holding faſt any ſlippery membranous part or veſſel, to remove dreſſings, *&c.* They are better made of ſteel well poliſhed than of ſilver, for greater ſtrength and neatneſs.

G Repreſents a pair of common ſtrait *Sciſſars* for the cutting of plaſters, compreſſes, bandage, ſkin, fleſh, *&c.* and for any other purpoſes which require Sciſſars. Of theſe there ſhould be ſeveral ſizes in the cheſt or ſtudy; but thoſe here repreſented for the pocket-caſe have uſually ly the ſhafts made of ſilver, as alſo have thoſe called *Probe-Sciſſars* marked E.

H Gives us the figure of a pair of *Spring-pliers*, ſerving chiefly for anatomical purpoſes, to clear parts by ſtripping off membranous filaments, or by raiſing them ſo as to diſſect them to more advantage. They are to be made of ſteel, and will upon occaſion ſuffice for all the purpoſes of thoſe before-mentioned F.

I A ſmall ſilver or ivory *Probe* or *Stilet*, with a pretty large globular head at one end, and a ſmall ſharp point at the other. This with the next Probe marked

K, furniſhed with a thin flat edge at one end, ſerve for diſcovering a fiſſure in the cranium, and for other purpoſes, wherein their figure gives them an advantage over the preceding Probe marked B.

L Repreſents a ſtrait double-edged *Biſtory* or *Inciſion-Knife*, which may ſerve upon all occaſions where a large lancet is required, as for cutting iſſues, making the firſt entrance into an abſceſs, &c.

M, N Repreſent crooked *Needles* for ſtitching up deep wounds of the ſkin, where the common, ſtrait, triangular-pointed Needle cannot be ſo conveniently applied.

O, P Repreſent crooked *Needles* of different makes, ſerving for the tying up of any blood-veſſels, as the crural and humeral arteries in

ampu-

amputations, the ſpermatic veſſels in caſtration, *&c.* That marked P is armed with a ligature or thread of a convenient ſize, which may be beſt made of the flaxen thread uſed by ſhoemakers, folded four, ſix, or eight of them together, and waxed; and this is not ſo apt to cut the veſſels, as ſmaller and common thread. This needle P is of a middling ſize, not much too ſmall for the largeſt veſſels, nor much too big for the leſſer: however, it will be convenient to have ſome of a ſize or two larger, and ſome of a ſize or two leſs, made of ſteel well temper'd, that they may neither bend nor break. Their incurvation ſhould be ſuch, as to form a perfect ſegment of a circle, which will enable them to paſs with greater readineſs round any veſſel. The convex ſurface of the needle tending to a point is flat, from whence it riſes up obliquely on each ſide towards the concave ſurface in a ridge; ſo that the needle is in effect triangular half way from the point, from whence it grows flat towards the eye.

Q Repreſents a flat crooked *Needle* armed with a ſizable thread, being ſharp-edged on its convex and concave ſide: this is formed thus to make the ſuture of a tendon, and is large enough for the *Tendo Achillis*; for being thin and flat, it wounds but few of the fibres of the tendon, and paſſes more eaſily through ſo reſiſting a body. But as we have before obſerved, the ends of a divided tendon will unite without ſuture, if they are only retained together, by keeping the parts in a proper poſture with compreſs and bandage.

R A crooked *Needle* of the ſmalleſt ſize, armed with a ligature for taking up the leſſer arteries, as thoſe of the ſkin in opening an abſceſs, or of the ſcalp in the operation of trepanning, *&c.*

S Repreſents a round crooked *Needle* with a flat point for the ſame purpoſes, but leſs convenient than thoſe preceding; though it is ſtronger, but more apt to ſlip in the holding of it.

T Denotes a ſilver or gold *Needle* armed with a ſteel point, which ſerves to introduce the reſt in making the twiſted ſuture for the hare-lip (*vid. Tab.* C. *Fig.* 8, 9.); afterwards the point is ſecured by fixing upon it a bit of wood, cork, *&c.* but thoſe who value not the expence of the needle cut off the point.

U Denotes a kind of *Needle* like a larder for the ſame operation of the hare-lip, ſerving to introduce a gold or ſilver wire: but as this makes a larger wound, and contuſes the parts more than the former, it ſeems leſs convenient.

An Explanation of Tab. II.

Fig. 1. Repreſents lint made up into various forms. (1, 2, 3.) doſſils of lint of various ſizes, (4, 5.) the ſame doſſils ſecured round the middle by a thread for the more eaſy extracting them, (6.) an oblong pledget, (7.) G a circular pledget, (8, 9.) tents of different ſizes. Theſe refer to *Q.* 6. *p.* 5.

Fig. 2. Gives a view of various compreſſes. A B denotes a ſquare and an oblong compreſs, which are the forms moſt frequently uſed. C D longitudinal compreſſes, the firſt ſerving to fill up inequalities; and the latter being ſlit up to the middle at one end, adapts it to the declivity of ſome limb, wrapping over each other as in the foliated bandage for a fracture of the leg. E a triangular compreſs being of a great thickneſs, and applied in ruptures to prevent the inteſtines or omentum from ſubſiding through the rings of the abdominal Muſcles. F a compreſs in form of a *Malta* croſs, cut in this ſhape to ſurround or wrap over the extremity of a limb that has been amputated. G a perforated compreſs, having a ſquare, round, or oval aperture to tranſmit the cannula in bronchotomy, or to give acceſs to a wound, *&c.* H a compreſs divided at each end to near the middle, to facilitate its application round any limb whoſe ſurface is unequal, by folding the ends over each other. I a compreſs adapted to the humerus or ſhoulder wounded or luxated, being ſlit up at each lower angle towards the middle, the better to adapt it to the globular figure of the part. K repreſents the rhomboidal compreſs, which being divided in the middle forms two ſcutiform compreſſes. L repreſents the ſtellate or ſextile compreſs, compoſed of three longitudinal ones croſſing each other, and ſewed together in the middle, which is ſometimes applied upon an aneuriſm or varix, or over the end of a ſtump; for being thick in the middle, it may compreſs or ſtop up the opening of any veſſel, or make reſiſtance where a part is too much relaxed. M a ſpheroidal compreſs or ball, which being cut in the middle forms two hemiſpherical compreſſes: the former or ſpheroidical compreſs ſerving to fix under the axilla in a luxation of the humerus,

TAB: II

Fig. 1.

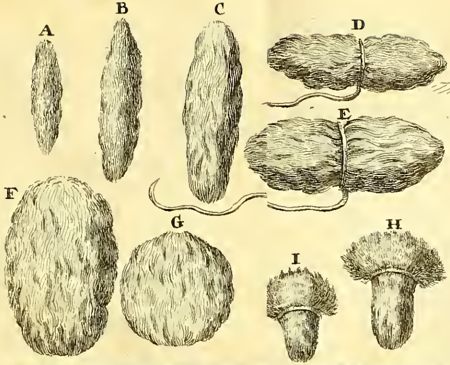


Fig. 5.

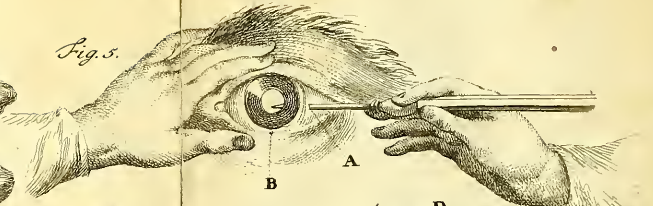
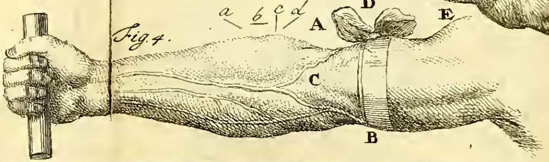


Fig. 4.



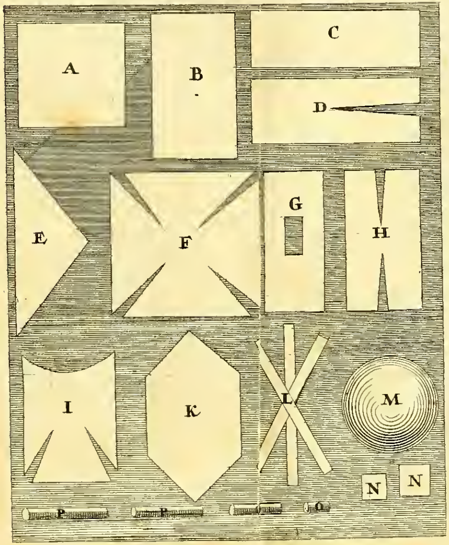


Fig. 2.

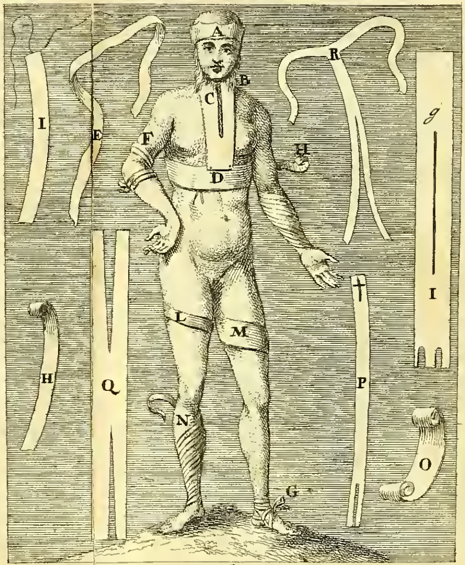


Fig. 3.

humerus, and the latter or hemiſpherical compreſs ſerves to fill up the palm of the hand, and ſtretch out the bones of the metacarpus in a fracture or luxation of them, *&c.* N N repreſent ſmall ſquare compreſſes to be applied after bleeding in the arm or foot. O O P P ſmall cylindric compreſſes ſometimes uſed to faſten the thread upon in tying up veſſels, and in making the ſutures of tendons to prevent the thread from diſtreſſing or cutting through the parts.

Fig. 3. Repreſents a view of the moſt general bandages both ſimple and compound. A the great kerchief or general bandage for the head, repreſented more at large in *Tab.* S. *Fig.* . C D repreſent the napkin and ſcapulary, or a general bandage in moſt diſorders of the thorax and abdomen. The ſcapulary marked *g* is ſo called from reſting upon the ſhoulders, and conſiſts of a piece of linnen of two or three feet in length, and ſix or eight inches in breadth, ſlit in the middle to tranſmit the head, and faſtened each end of it to the napkin D, which ſhould be long enough to extend quite round the body. The napkin is to be folded three or four times together to make it of a convenient breadth for ſecuring the dreſſings. F repreſents the manner of applying the fillet after bleeding in the arm. G repreſents the manner of applying the fillet after bleeding in the foot, both which may be ſeen more at large in *Tab.* S. *Fig.* 1. H the deloire or ſpreading ſpiral Bandage applied to the arm; N the ſame applied to the leg. E denotes a common fillet, looſe, and to be applied after bleeding in the arm or foot, *&c.* I a ſhort fillet with a thread faſtened to the end for making the circular or annular bandage. H a ſingle-headed roller to be applied with one hand. O a double-headed roller to be applied with both hands, and in different directions. Q a four-headed bandage made by ſlitting it up at each end, which may be repeated two or three times more upon occaſion on each ſide. P a ſmall retentive bandage ſlit up at one end, and furniſhed with an opening in the other end, ſerving to ſecure the dreſſings upon a finger, thumb, penis, *&c.* It will alſo ſerve for an uniting bandage, when made of a greater length, to retain together the longitudinal lips of a wound inſtead of a ſuture. I, *g*, the ſcapulary bandage, which is ſupported upon the ſhoulders before and behind, as at C in the *Figure* I. R the T bandage of *Heliodorus* made of two ſimple bands ſewed together, being applied round the waſte to retain the dreſſings after cutting for the ſtone, and in diſorders of the anus and Perinæum ; or in an inverted poſture like the napkin and ſcapulary for dreſſings of the thorax. Sometimes there are two pieces ſewed on to the waſteband at a little diſtance from each other, and then it is called a double T bandage.

Fig. 4. Repreſents the veins commonly opened for bleeding in the arm. A D the ligature applied with a ſlip-knot to compreſs the veins, and render them turgid. C denotes the median vein, under which the tendon of the biceps muſcle uſually lies. B the baſilic vein, which runs up on the inſide of the arm towards the elbow, having uſually the cubital artery and brachial nerve ſeated underneath it. E the cephalic vein, which aſcends along the ſide of the biceps muſcle on the outer part of the arm, but having no tendon, nerve or artery ſeated under it, may be therefore opened with more ſafety by an unſkilful hand; only being much leſs than the two former, it commonly diſcharges but little blood, and ſeldom in a full ſtream. *a b c d* repreſent the courſe or direction of the orifice to be made by the lancet in the vein, namely, either oblique, which is moſt preferable, aſcending or deſcending (*a d*); longitudinal, according to the courſe of the vein (*b*); or tranſverſe (*c*). For it is obſervable, that wounds made obliquely with reſpect to the courſe of the fibres, heal more readily, and with a leſs ſcar than thoſe made tranſverſly; becauſe in the latter caſe the fibres contract themſelves more, and do not apply their ends to each other with ſo large a ſurface: but if the orifice is made longitudinal according to the courſe of the vein, the ſides collapſe together by the touching of the ſkin, and the blood does not flow ſo freely, unleſs the ſkin be relaxed by bending the arm.

Fig. 5. Repreſents the proper part of the ſclerotica, where the couching needle is to be introduced for depreſſing a cataract. A the couching needle, held like a pen in the right hand, with its point introduced near the center of the apparent white part of the eye. B the point of the needle appearing behind the pupil, while the eyelids are held open by the fore-finger and thumb of the left hand, which method is rather preferable to the uſe of the ſpeculum oculi. The lower fingers of the right hand are ſupported on the patient's cheek to ſuſtain the inſtrument, while it is entered at about the diſtance of half a quarter of an inch from the cornea.

An Explanation of Tab. III.

Fig. 1. Repreſents a lancet with a ſhort blade *a b*, as that can be more commodiouſly guided, forming a large angle, or with broad ſhoulders towards the point *a c*, which is by the *French* termed a barley-grain point, being very commodious for opening of the largeſt and moſt ſuperficial veins.

Fig. 2. Is a lancet with narrower ſhoulders and a ſtill ſhorter blade, forming a more acute angle towards the point, being called by the *French* an oat-grained point, being more ſuitable than the former for the ſmaller and deeper veins.

Fig. 3. Repreſents a ſmaller oat-grained lancet, extremely commodious for bleeding eaſy in a ſkilful hand, and when a vein does not eaſily appear.

Fig. 4. Repreſents one of the moſt acute-pointed lancets, called by the *French* a ſerpentine point: being uſeful for bleeding eaſy in a ſkilful hand, and to open very ſmall veins in an infant, under the tongue, in the white of the eye, *&c.*

Fig. 5. Repreſents a ſmall abſceſs lancet fixed in a ring, ſo as to be commodiouſly concealed in the hand, when there is occaſion to make an inciſion, under a pretence of healing the part, in a timorous patient who will not admit of the knife.

Fig. 6. Repreſents the trefine, ſo called by *Woodal* from its having three ends, and prevails among us more than the trepan, as it may be more

TAB: III.

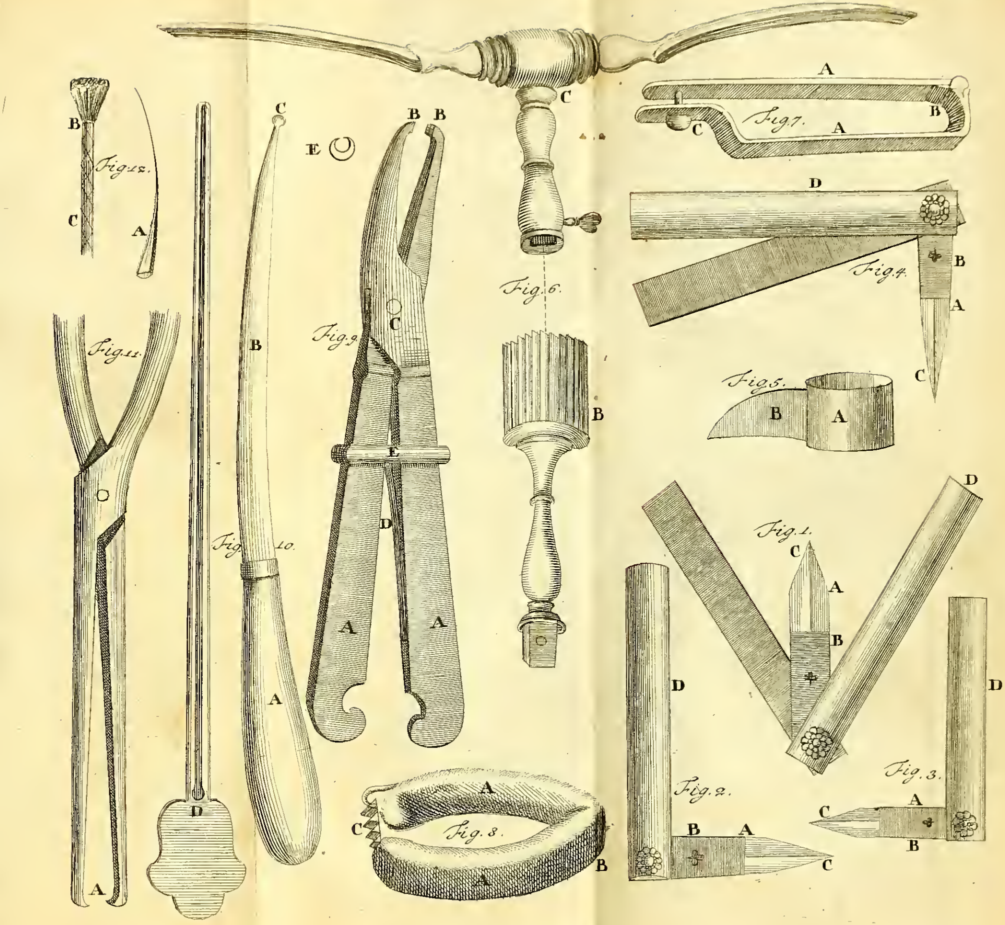


Fig. 12.
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Fig. 11.
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Fig. 10.
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Fig. 9.
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Fig. 5.
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Fig. 3.
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more conveniently held or directed to preſs more on one ſide than the other, according as the thickneſs of the bone may require. A C the handle of the trefine, into which is fixed the crown B, which is made cylindrical, or at leaſt very nearly ſo; inſtead of being conical like the crown of the trepan, *Tab.* a. *Fig.* 1. which greatly expedites the working of the inſtrument, which being performed more ſlowly, and with more exactneſs and regularity than the trepan, is not in danger of wounding the brain in a careful hand; to avoid which, the crown of the trepan was at firſt formed of a conical ſhape. So that what in this reſpect ſeemed to be a very great improvement upon the ancients about an hundred years ago, is at preſent thought rather an incumbrance and impediment in a ſkilful and careful hand. However it muſt be confeſſed, that the trepan, *Tab.* E. *Fig.* 1. ſtill prevails in moſt other parts of *Europe*; though the trefine is preferred by the moſt expert ſurgeons here at *London*.

Fig. 7. Repreſents a ſteel inſtrument called a yoke, to be wore upon the penis for an incontinency of the urine, being firſt covered with velvet: it opens with a hinge B at one end, and is faſtened with a ſcrew C at the other, and muſt be taken off when the patient has a call to make water. The compreſſure upon the Urethra may be leſſened or increaſed by letting out or ſhortening the ſcrew.

Fig. 8. Repreſents a yoke of another form cloathed fit for uſe. A A the two plates or arms covered. B the hinge by which the two arms are joined. C a graduated ketch with a hook, whereby by the inſtrument may be contracted or enlarged at pleaſure.

Fig. 9. Repreſents a needle-holder. A A two flat ſhanks or handles. BB the two ſides of its mouth grooved for keeping the needles firm. C the hinge. D a ſpring which keeps the handles aſunder, with the mouth open B B, until the ſliding ketch E is thruſt towards A A. This inſtrument holds a needle as ſecure as any, and more ſecurely than moſt other tenacula.

Fig. 10. Repreſents a biſtory with a grooved director for enlarging wounds, *&c*. A the handle of the knife. B the blade. C a button at its point. D the handle of the director, having a hollow groove; a tranſverſe ſection of which is repreſented at E, ſo that when the button of the knife C has once entered the opening of the groove near the handle D, it cannot ſlip out in opening a ſinous ulcer, (if ought to which the common biſtory and director are liable) until it paſſes out at the other extremity of the director.

Fig. 11. Repreſents the blades of a pair of ſtrong forceps for extracting bullets. In the mouth A there are two ſmall ſharp teeth on each ſide, which apply cloſe together when ſhut. The forceps here repreſented may be introduced into a wound ſafely when ſhut; and the blades being opened immediately behind the bullet, the teeth piercing into the lead, may have ſufficient hold to bring it out, though they are not advanced ſo far as the largeſt part of it.

Fig. 12. Repreſents a ſcarificator for the eyes made

Tab. Λ

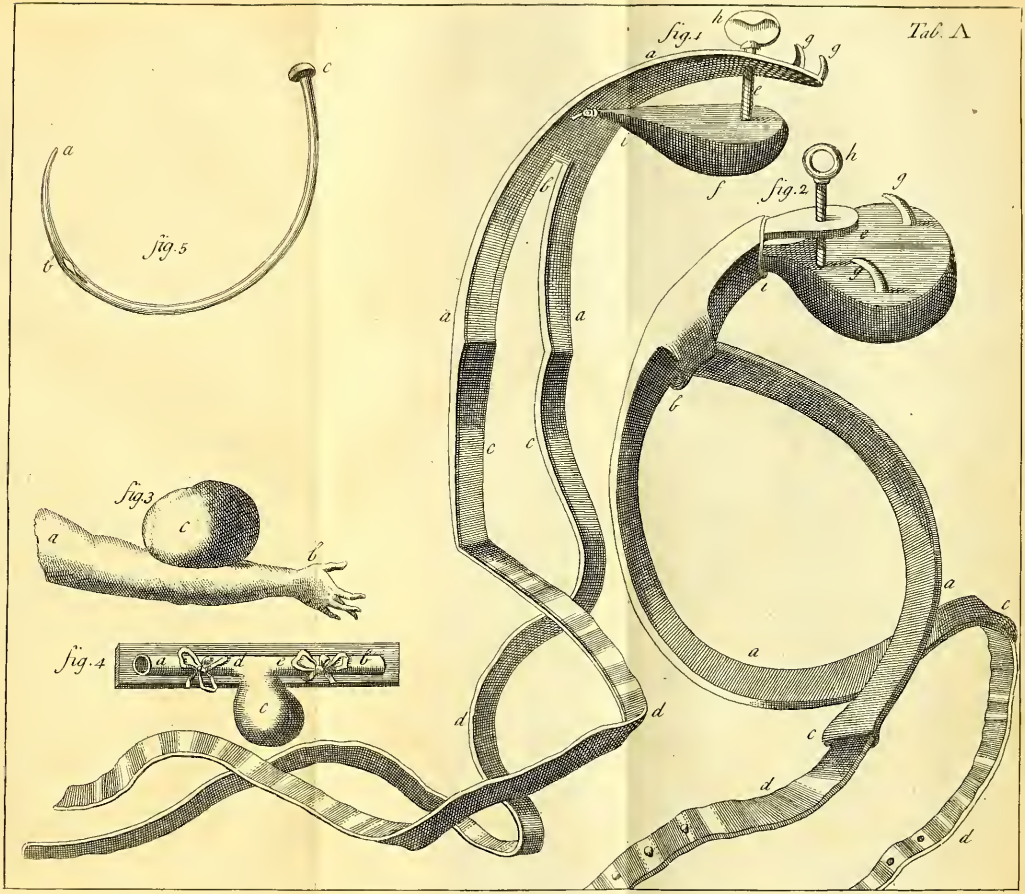
fig. 5
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fig. 4
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made of the beards of barley, which being rough like the teeth of a ſaw, as may be ſeen in that marked A, ſeveral of them are therefore tied together into a bruſh, repreſented by B C. But although ſcarification of the eyes may be very uſeful in an ophthalmia, yet it cannot be ſo ſafely performed with this eye-bruſh as with a fine ſteel raſp of a convex figure, as in *Tab.* X. *Fig.* 18. for the teeth of the barley-ears being brittle, are left behind among the very ſenſible fibres of the albuginea, ſo as rather to increaſe the inflammation, or do as much hurt as the evacuation does good.

TABLE A.

The Inſtruments for Aneuriſms.

Fig. 1. Is an inſtrument deſigned for preventing and curing Aneuriſms by compreſſion; *a a a* denote the plate of iron or ſteel, adapted in form to the flexure of the arm; *b* its fiſſure; *cc* ligatures faſtened to the ends *aa*, and extended to *dd*; *e* denotes a moveable ſteel plate joined by the hinge *i*, and covered with a bolſter of cotton or ſilk at *f*, to be fixed upon the Aneuriſm. *gg* are two ſmall hooks by which the inſtrument is faſtened upon the arm by the ligatures *cc dd*. *h* is a ſcrew by which the plate and cuſhion *ef* are preſſed down upon the tumor.

Fig. 2. Is an inſtrument of the ſame kind with the former, but of a different ſhape. Here the plate and bolſter *ef* are larger for bigger Aneuriſms than the former. Its parts and explanatory letters correſpond to thoſe of the preceding figure.

Theſe inſtruments are to be applied for reſtraining

ing the enlargement of an incipient Aneuriſm, or for compreſſing thoſe which are not very large, which by means of this inſtrument and a ſtrengthening plaſter, are ſometimes compleatly cured without the operation. In the application of them the incurvated part *aaa* is to be applied ſo as to tranſmit the elbow, while the compreſs or cuſhion marked *f* comes over into the flexure of the arm upon the Aneuriſm; and the whole inſtrument is then to be ſecured by the ligatures *cc*, *dd*, faſtened to the hooks *gg*.

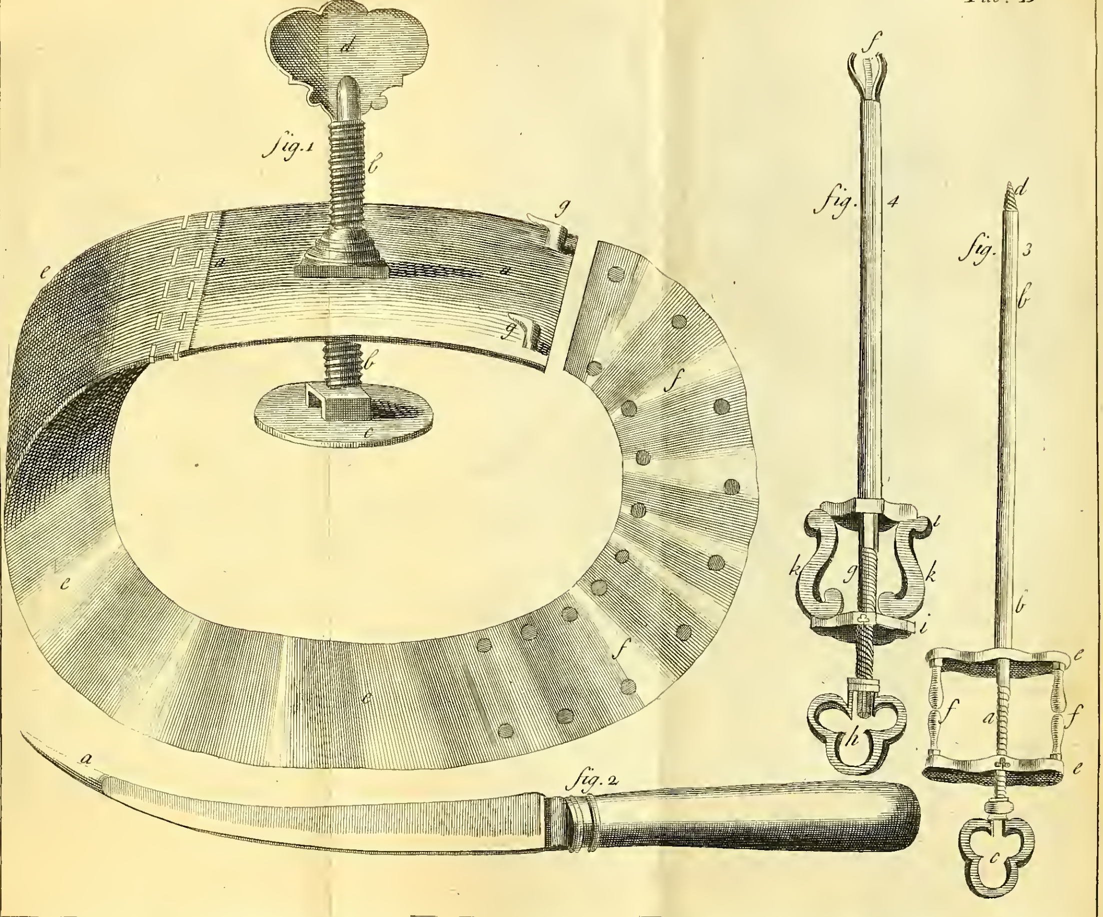
Fig. 3. Repreſents a large Aneuriſm in the joint or flexure of the arm; *a*, *c*, the arm; *b* the Aneuriſm.

Fig. 4. Is an obtuſe-pointed needle for conveying a ligature round the artery in the operation for an Aneuriſm, and to ſuppreſs hæmorrhages. *a* is the obtuſe point, *b* the eye of the needle which tranſmits the thread, *c* the head or handle which may be more commodiouſly made flat, according to M. *Garengeot* about the breadth of one's thumb.

Fig. 5. Exhibits the manner of applying the ligatures above and below the Aneuriſm in the operation for that diſorder. *a*, *b*, the artery, *c* the Aneuriſm, *d e* the ligatures above and below the Aneuriſm.

TABLE B.

Fig. 1. A tourniquet to compreſs an artery in the operations for an Aneuriſm, or to ſuppreſs an hæmorrhage, conſiſting of a braſs plate *aa*, of three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e
c

three inches long and two broad, perforated in the middle to admit a ſtrong ſcrew *b b*, which is provided at the lower end with a ſmall round plate *c*, a piece of leather is ſtrongly faſtened to one end of the braſs plate, of equal breadth with it, *ee*, *ff*. In violent hæmorrhages, *&c.* the inſtrument is fitted to the wounded part, and the end *f* is by means of holes that are made in it faſtened to the hooks *gg*, ſo that the ſmall plate *c* may exactly preſs upon the artery; and then the handle of the ſcrew *d* is to be turned round gently, till a ſufficient preſſure is made to ſtop the courſe of the blood.

Fig. 2. An obtuſe-pointed knife for enlarging wounds, or dividing the integuments without danger of injuring the nerves or blood-veſſels.

Fig. 3. An inſtrument for extracting bullets, compoſed of a ſcrew and a cannula, deſigned chiefly for extracting them when other inſtruments are inſufficient, or when they are lodged in the bones. *a* denotes the ſcrew by which it deſcends and aſcends through the cannula, *b* the handle, *c* the bit which enters the bullet, *d* the cannula, *ee* two croſs bars to ſuſtain the ſcrew and cannula; *ff* two pillars for ſuſtaining the croſs bars, taken from M. *Garengeot.*

Fig. 4. Is another inſtrument for extracting bullets in the ſoft parts; *f* denotes three branches which come through the cannula ſerving to take hold of the ball, *g* the ſimple ſcrew turned by the handle *h*, and moving in the croſs bars *i i*, ſuſtained by the pillars *l l*, taken from M. *Garengeot.*

TABLE C.

Fig. 1. Exhibits the manner of uniting wounds by the dry ſuture, that is to ſay, with ſticking plaſters applied to the ſkin, ſo as to retain the wounded lips cloſe together. *a* denotes two ſticking plaſters without indentations, *b* denotes two plaſters of the like kind indented to expoſe the lips of the wound to view, and make way for the diſcharge of its matter, as well as for the application of medicines; *c* a ſingle plaſter of the like kind.

Fig. 2. Exhibits another manner of making the dry ſuture by ſticking plaſters, uſed by the ancients, which are faſtened together by hooks and eyes *bbb*, or by a ſtring drawn through them in the manner repreſented by *aaa*; and this method has the advantage of the former, inaſmuch as by ſhortening the ſtring, the lips of the wound may be more cloſely approximated without removing the ſticking plaſters.

Fig. 3. A large crooked needle, with a double thread, to make the quilled and other ſutures in large wounds. *a* the needle arched, *b* the double thread, *c* the bow end of the thread.

Fig. 4. *aa* denotes a large tranſverſe wound united by a triple interrupted ſuture *bbb*.

Fig. 5. Repreſents another tranſverſe wound united by the quilled ſuture of *Palfinus*; *aa*, *bb* are two cylindrical rolls of ſilk or linnen ſpread with ſome cerate or plaſter, *ccc* the ſlip-knots of the thread

Tab. C

fig. 1

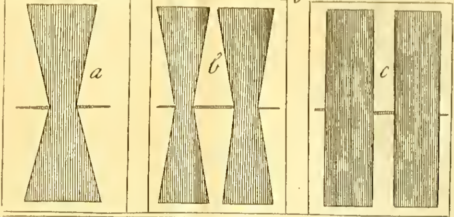
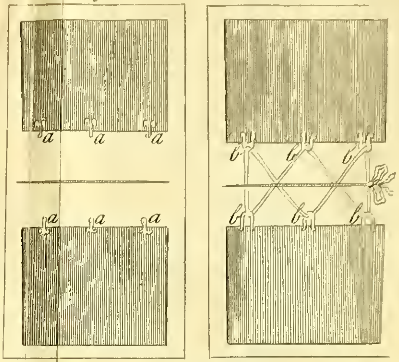


fig. 2



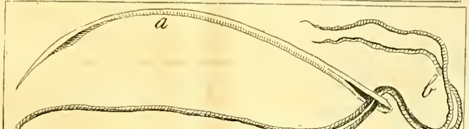


fig. 3

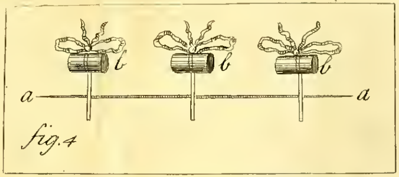


fig. 4

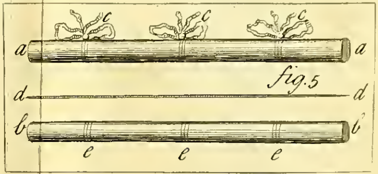


fig. 5

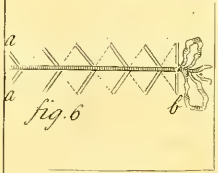


fig. 6

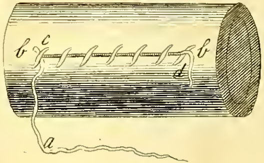


fig. 7

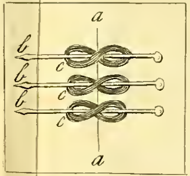


fig. 8

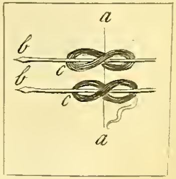


fig. 9

thread tied upon the roll of emplaſter on the upper lip of the wound, while the other roll that lies upon the other lip of the wound is intercepted by the bow end of the threads *e e e.*

Fig. 6. Repreſents the ſuture of *Celſus* (*lib.* 7. *cap.* 16.) for performing the operation of Gaſtroraphia in wounds of the abdomen. But this method is at preſent out of practice, as it too much confines and inflames the lips of the wound; *a a* the ſtitches traverſing each other, *b* the ends of the threads tied in a knot.

Fig. 7. Repreſents the glover's ſuture, made for wounds of the inteſtines; *a* the thread, *b b* the wound of the inteſtine, *c* the beginning of the ſuture, *d* the end of the ſuture faſtened by a knot.

Fig. 8, 9. Repreſent the twiſted ſuture made for uniting the hare-lip and other wounds, being made with one, two, three, or more needles, according to the length of the wound; *a a* the wound, *b b* the needle paſſed through the lips of the wound, *c c* the thread twiſted round the needles.

TABLE D.

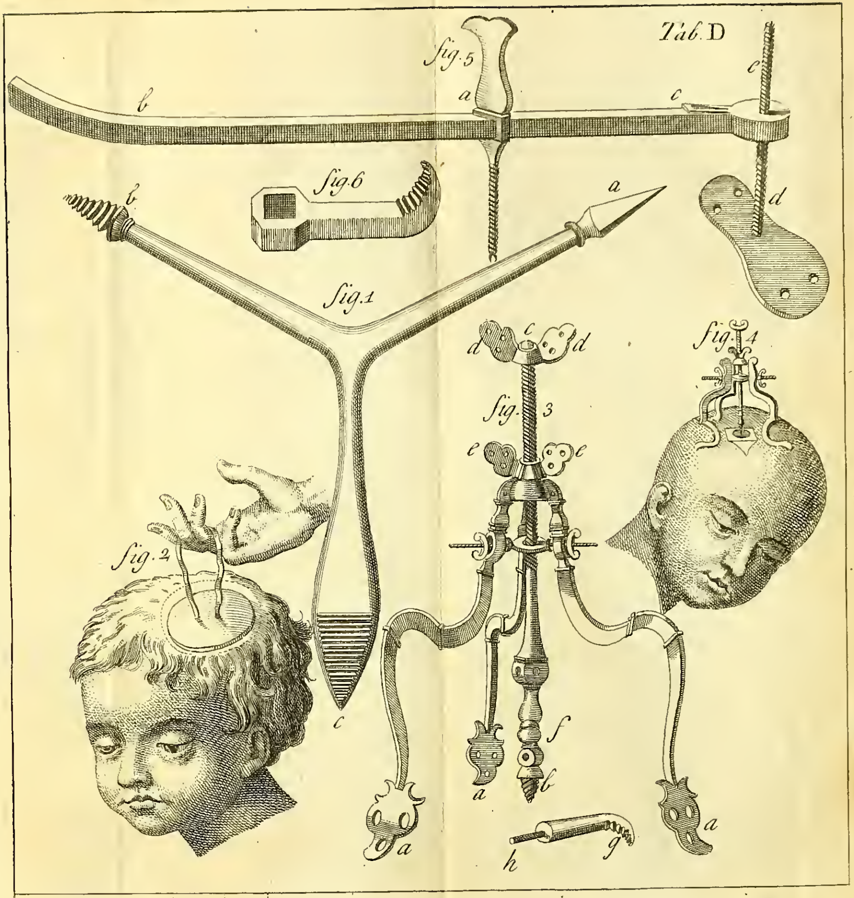
Fig. 1. Is a ſteel inſtrument uſeful in various diſorders of the ſkull; *a* denotes a ſmall terebra for perforating the external table of the ſkull down to the diploe, *b* a ſcrew to penetrate the bones of the ſkull, after a ſmall opening has been made for it by the other point marked *a*, in order to raiſe a depreſſion of the bones, *c* is an elevator for the ſame purpoſe.

Fig. 2. Repreſents the method of raiſing a depreſſed cranium in young children, by the uſe of a firm ſticking plaſter.

Fig. 3. Repreſents the tripode elevator of *Parey* and *Scultetus* for raiſing a depreſſure of the cranium. This inſtrument is about as large again as the figure. The feet marked *a a a* may be brought nearer to, or removed farther from each other, by letting out or taking in the ſcrews above. The feet of this inſtrument being applied to the ſound part of a ſkull, the ſcrew *b c* is then entered into the depreſſed bone, by turning round its handle *d d*, after an entrance has been firſt made into the bone for its point *b*, by the uſe of the triangular point of the inſtrument marked *a Fig*. 1. Having once entered the ſcrew *b*, it is then raiſed by degrees together with the depreſſed bone, by turning round the female ſcrew *e e*. But if any fiſſure or opening appears betwixt the fractured or depreſſed ſkull, in that caſe the ſcrew *b* may be taken off, and the elevator marked *g* may be faſtened on by the ſcrew *h*, at the part of the inſtrument marked *f*; after which by turning round the female ſcrew *e e*, the depreſſed bone will be raiſed as before.

Fig. 4. Shews the manner in which the preceding inſtrument is applied to the head.

Fig. 5. Repreſents the elevator of *Hildanus* (*cent*. 2. *obj*. 14.) for raiſing a depreſſion of the ſkull, which is much more ſimple and equally convenient for the purpoſe with the former. You are to be provided with the ſcrew *a*, and with the hook, *Fig*. 6; through either of which the lever marked



Tab. D

Tab. E

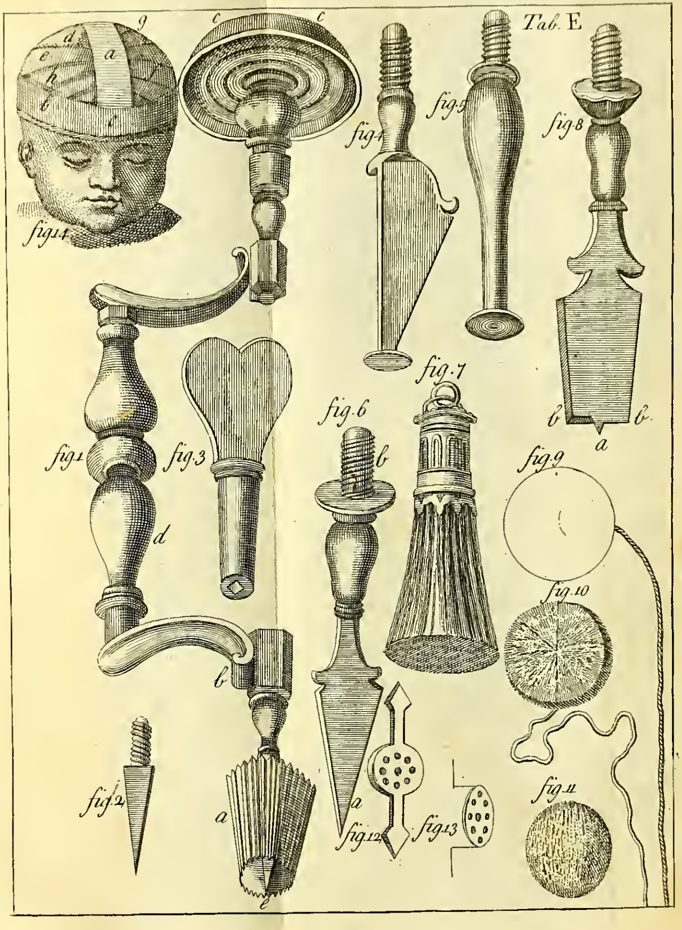

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fig.9
fig.10
b
fig.2
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a
e
fig.12
fig.13
fig.11

marked *bc* may be paſſed, after the ſcrew or hook is properly fixed upon the depreſſed bone. The plate *d* being placed upon a ſound part of the head with a linnen compreſs under it; then by raiſing the end of the lever marked *b*, which may be raiſed or depreſſed at its other end by the ſcrew *e*, the hook *Fig.* 6. or the ſcrew *a*, is by that means elevated together with the depreſſed bone.

TABLE E.

Contains the inſtruments for the operation of trepanning the ſkull.

Fig. 1. The modern trepan; *a* denotes the crown, *b* the part where the crown is ſcrewed on to the handle, *c c* the upper moveable part of the handle, upon which the hand or chin is preſſed in the operation, *d* the arch of the handle by which the inſtrument is turned round, *e* the pyramid or ſpindle of the crown, by which it is kept from moving out of the circle of the bone, unleſs the teeth of the crown have entered ſufficiently deep, after which the ſpindle is taken out.

Fig. 2. The pyramid or ſpindle taken out of the crown.

Fig. 3. Is a key or winch by which the ſpindle is taken hold of, and ſcrewed into the crown.

Fig. 4. Is a lenticular ſcalpel to ſmooth the rough edges of the bone after the uſe of the trepan.

Fig. 5. Is a ſteel depreſſor or meningophylax to preſs down the dura mater, and diſcharge the confined blood.

Fig. 6. Is a ſort of terebra to be faſtened to the handle of the trepan after taking off the crown, ſerving to make the firſt entrance for the ſpindle of the trepan, as alſo to perforate a bone in a ſpina ventoſa, whence it is alſo called the perforating trepan.

Fig. 7. Is a hair-bruſh to cleanſe the teeth of the crown of the trepan from the ſaw-duſt.

Fig. 8. Is an exfoliating trepan, ſometimes uſed to pare away a carious part of a bone. *a* the point which keeps it fixed in the bone, *b b* the wings which ſcrape the bone when the inſtrument is turned round.

Fig. 9. A doſſil of lint ſecured by a thread for the dreſſing after trepanning.

Fig. 10. Is a pledgit or round compreſs of ſcraped lint ſecured with a thread.

Fig. 11. Is another pledgit of lint without a thread, to fill the aperture of the cranium.

Fig. 12. Is a leaden plate of *Belloſte*, perforated with ſmall holes, to be applied in order to make a reſiſtance upon the brain, and prevent a fungus.

Fig. 13. Repreſents the manner in which the handles of the aforeſaid leaden plate are to be bent, in order to adapt themſelves to the opening of the ſkull.

Tab. F

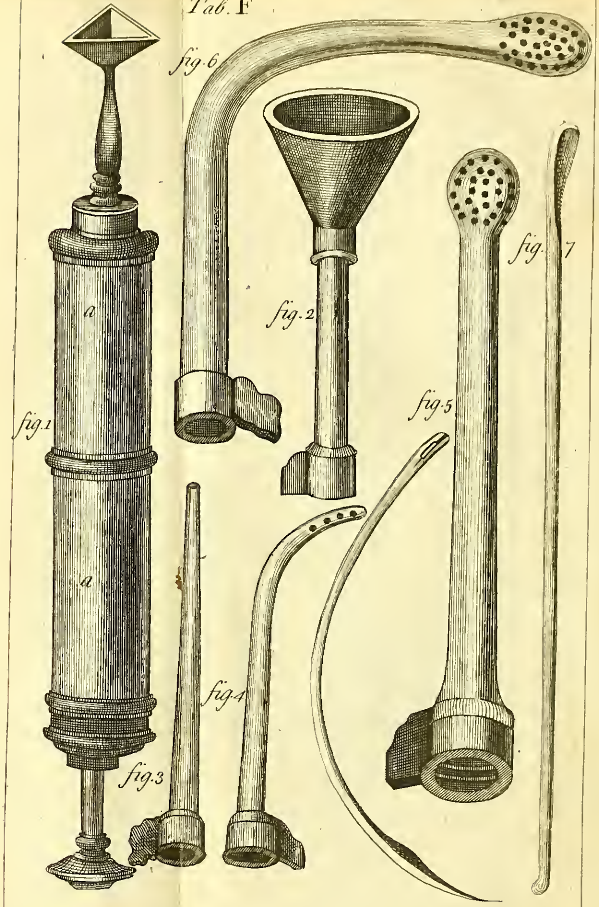


Fig. 14. Repreſents the capeline bandage to retain the dreſſings after the operation of trepanning, deſcribed Q. 131.

TABLE F.

A Syringe furniſhed with ſeveral pipes for injecting liquors into the thorax or abdomen, and for drawing extravaſated blood out from thence.

Fig. 1. The ſyringe, which will not only ſerve to inject liquors in wounds of the thorax and abdomen, but likewiſe into the fauces, ulcers, and uterus, *&c.* and this will alſo ſerve to extract blood or matter from the cavity of the thorax.

Fig. 2, 3. Are pipes to be ſcrewed on to the ſyringe *a a Fig.* 1. for various uſes.

Fig. 4. Is a curved pipe with holes in its extremity, for extracting blood, matter, or injected liquors out of the thorax.

Fig. 5, 6. Are pipes perforated like a cullender, for conveying injections from the ſyringe, the latter being calculated for uterine injections.

Fig. 7. A kind of probe with an excavation at one extremity like an ear-pick, and ſerving for various uſes in wounds of the thorax and other parts.

TABLE G.

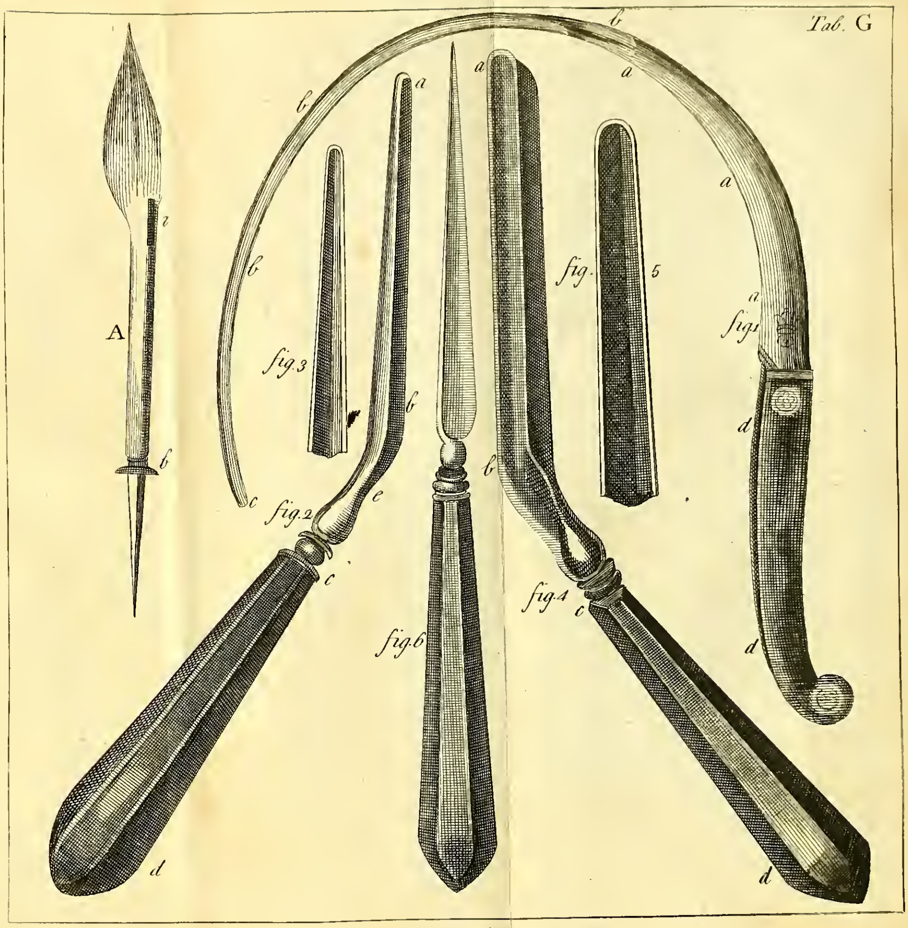
Repreſents the inſtruments ſerving to lay open ſinuſſes and fiſtulæ by inciſion, particularly thoſe of the anus.

Fig. 1. Is one of the moſt convenient and uſeful of the modern ſyringotomi or ſcalpels for opening fiſtulæ of the anus, invented and publiſhed by *Baſſius*. *a a a* denote the edge of this falciform ſcalpel, *b b* the flexible probe-end made of ſilver, *c* the point or end of the probe, *d d* the handle in which the edge of the ſcalpel *a a a* is concealed.

Fig. 2, 3, 4, 5, 6. Repreſent the inſtruments recommended for opening fiſtulæ by *Rungius*, a ſurgeon of *Bremen*. *Fig.* 2. *a b* a grooved probe or director, *c d* the handle, *e* the part where the director is uſually bent according to the courſe of the fiſtula. *Fig.* 3. gives a direct view of the groove in the director, as the preceding gave an oblique view. *Fig.* 4. *a b* repreſents a cannula to be paſſed into the anus for the reception of the edge of the knife, marked *Fig.* 6. that it may not hinder the adjacent parts in cutting the fiſtula, *c d* its handle inclined to the oppoſite ſide. *Fig.* 5. Repreſents a direct view of the cavity in this cannula, that its diameter may be the better diſcerned. *Fig.* 6. Repreſents a long and narrow ſcalpel, which in cutting for a fiſtula is conducted through the groove of the director, *Fig.* 2. into the cavity of the cannula, *Fig.* 4.

Fig. A. Repreſents a ſeton needle, the point of which is ſhaped like a lancet; *a* the eye of the needle, *b* the part which is to be fixed in a handle.

Tab. G



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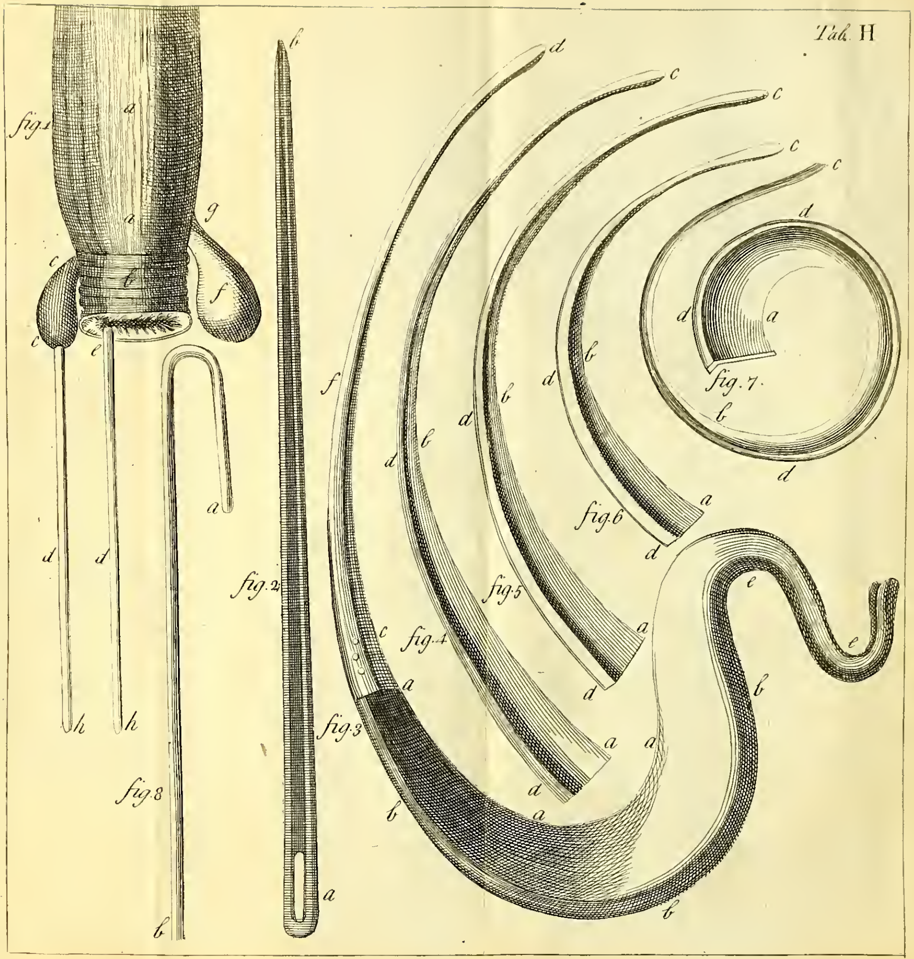
fig. 1
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TABLE H.

Relating to fiſtulæ of the anus.

Fig. 1. Repreſents the two ſpecies of fiſtulæ in the anus, the one opening into the rectum only, and the other opening outwards as well as into the rectum; *a a* denotes part of the inteſtinum rectum, *b* the ſphincter of the anus, *c c* a perfect or compleat fiſtula ani, terminating with one aperture externally, and the other in the inteſtine; *d d* a flexible probe, or ſilver wire, paſſed through the two orifices of the fiſtula, and bent ſo as to come through the anus *e*; the two ſides of the wire, intercepting the fleſhy parts to be divided, are drawn gently outward, for the more ſafe and convenient performance of inciſion; *f* repreſents an imperfect or incompleat fiſtula, having only the orifice *g* opening into the inteſtine; *h h* denote the two extremities or heads of the ſilver wire.

Fig. 2. Repreſents an inſtrument like a large needle, from *Garengeot*, made of flexible ſilver, having an eye marked *a* for the tranſmiſſion of a ligature, when any one would by that means divide the parts, according to the advice of the ancients; and it may alſo ſerve to convey a ſlip of linnen through a wound or ulcer in the manner of a ſeton: *b* the point of the inſtrument, which is to perforate the inteſtine in an incomplete fiſtula, and then to be inflected and brought out through the anus; it has a groove running through its whole length, by which it may ſerve to guide the knife inſtead of a director.

Fig. 3. Is a kind of ſyringotomus taken in part from *Garengeot*'s treatiſe on inſtruments (*Tom.* I. p. 337.) *a a a* denotes the concave and ſharp-edged part for cutting, *b b b* its convex back which is obtuſe, *c d* the ſilver wire or probe end, which is flexible and beginning at the letter *c*, terminates at the point *d*; the part marked *e e* being bent in form of a hook, ſerves as a handle to facilitate the cutting of a fiſtula when it is very hard and callous; *f* denotes where the inſtrument terminates, without the part *d f*, by which means it more commodiouſly performs its office, than if it were of the whole length here repreſented.

Fig. 4, 5, 6, 7. Repreſent ſeveral common ſyringotomi of the ancients, of different ſizes and curvatures, and furniſhed either with obtuſe or ſharp points, according to the different circumſtances of fiſtulæ; in theſe the part which cuts is marked *a b*, *c* the probe end, *d d* the convex and obtuſe back.

Fig. 8. Denotes a flexible ſilver probe or wire bent in ſuch a manner, that the part *a* being introduced through the orifices of the fiſtula, and brought towards the other end, a ſpace is formed for intercepting and extending the parts of the fiſtula to be inciſed.

TABLE I.

Fig. 1. A pair of large forceps or cutting-pincers to take off ſplinters or fragments of bones; but they will cut eaſier provided the handles are made two or three inches longer than the figure.

Fig. 2.

Tab. I

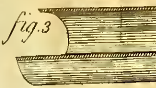
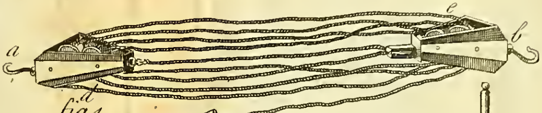


fig. 3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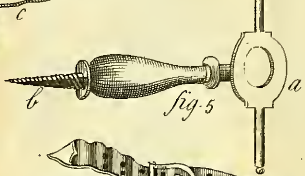


fig. 5

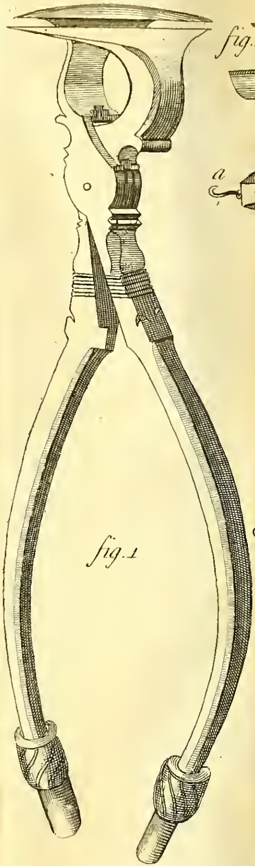


fig. 1

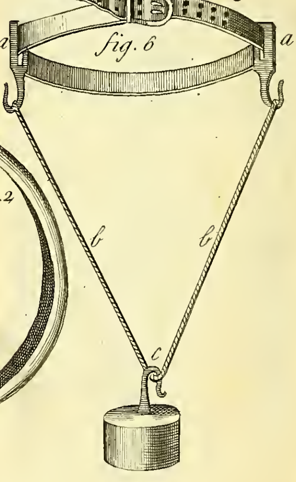


fig. 6

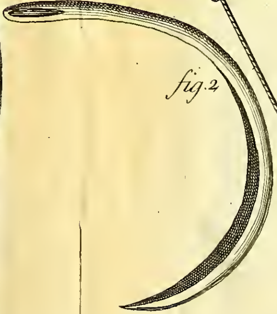


fig. 2

Fig. 2. Is a large crooked needle ſerving to paſs ligatures under wounded veſſels, in order to conſtringe them; and if it be made proportionably larger, it may ſerve to convey ligatures under a cancerous breaſt, in order to elevate the ſame in extirpation.

Fig. 3. Repreſents a paſteboard caſe, in which a fractured arm is to be lodged, after it has been ſet and dreſſed. The ſize of this is to be adapted to that of the limb.

Fig. 4. Is a polyſpaſton or compound pully uſed to extend fractures, when the ſtrength of the hands is not ſufficient. *ab* are two hooks by which the inſtrument is faſtened one way to the ſcrew, *Fig.* 5. fixed in ſome poſt or beam, and the other way to the middle of the rope *c*, belonging to the belt, *Fig.* 6. faſtened round the limb; *c* the rope, by drawing which an extenſion is made upon the broken limb; *de* are the two pullies conſiſting of ſeveral wheels, by which the force of the drawer is very much increaſed; ſo that the greater the number of wheels over which the rope paſſes, the more eaſily and gradually may the extenſion be made, inſomuch that by this means one man may exert a greater force than ten. This inſtrument is more particularly uſeful to make an extenſion in fractures of the thigh-bone, becauſe there the muſcles are ſo large and ſtrong, that their force cannot be eaſily overcome by an extenſion of the hands only.

Fig. 5. Is a ſtrong iron ſcrew, whoſe worm *b* is to be forced by the two handles into ſome poſt or beam, in order to faſten the hook *b* of the preceding pulley upon the ring *a*.

Fig. 6. Repreſents the girt of *Hildanus* to be faſtened round the lower part of the limb, in order to make an extenſion, either by pulling with the hands with a napkin, or by appending the weight *c*, or elſe by applying the polyſpaſton before deſcribed, inſtead of the weight *c*; *a a* two hooks through which the girt is paſt, upon which hooks is hung the ſling or rope *b b*; *c* the place where the extending force is applied.

TABLE K.

Fig. 1. Repreſents the foliated bandage to be applied in compound fractures. This bandage conſiſts of eighteen leaves, nine on each ſide, the innermoſt being ſhorter than the reſt. Theſe leaves are applied obliquely over each other, thoſe in the middle firſt, and afterwards thoſe at each end.

Fig. 2. Repreſents the machine commonly called the ambe of *Hippocrates*, formerly much uſed for reducing diſlocations of the humerus; it conſiſts of the fulcrum *a a*, to which is faſtened the moveable lever *b c*, joined to each other by a ſort of moveable articulation *d*. In uſing this inſtrument, the diſlocated arm is faſtened to the lever *b c*, by inclining which the arm is at the ſame time extended, while the head of the humerus is thruſt into its place by the end *c*.

Fig. 3. Is a machine contrived by M. *Petite*, for reducing luxations of the humerus, and of other

fig. 6

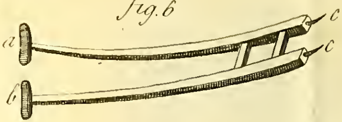


fig. 2

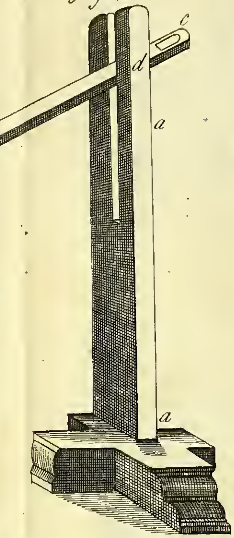
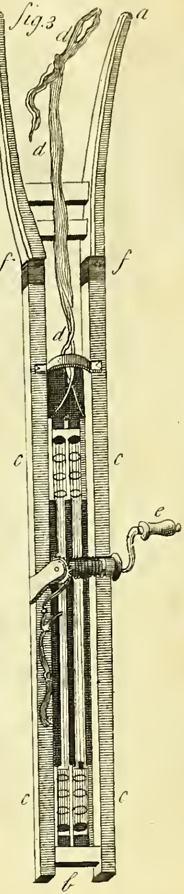


fig. 3



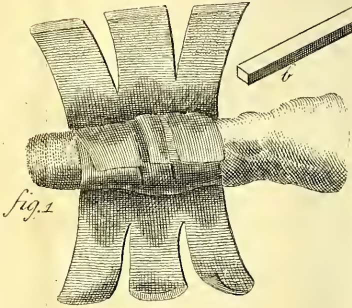
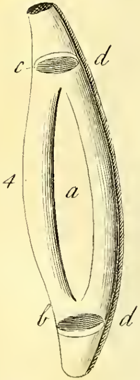


fig. 1

fig. 4



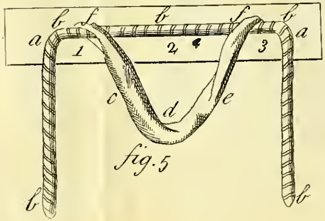


fig. 5

other joints ; *a a* repreſent two arms, by which the patient, and particularly the ſcapula, is held firm from giving way in the extenſion ; *b* the other end of the inſtrument reſting upon the ground or floor ; *c c* pullies of the machine, *d d* the rope, by winding up which an extenſion is made ; *e* the handle, by turning which the rope is drawn tight, and extends the limb ; *ff* the part where the two horns are joined to the body of the machine.

Fig. 4. Denotes a retinaculum or ſupporter to be uſed in luxations of the humerus. *a* an opening or ſlit in the machine, which is made of ſtrong ticken lined with leather ; *b c* the ſhape of it at each end, *d d* two apertures through which the two legs or horns *a a* of the preceding inſtrument are tranſmitted.

Fig. 5. Repreſents a particular ſling of M. *Petite*, proper to extend luxated limbs. *a a* the part made with leather, *b b b* a ſilken ligature ſown to the leather in three places, at 1, 2, 3 ; the part *a a* is faſtened round the arm ; *c d e* is a ſtrong loop faſtened to the ſilken ligature at *ff*, ſo as to be moveable.

Fig. 6. Is an inſtrument recommended by M. *Petite* for the reduction of a luxated femur when it is diſlocated forward. It is faſtened at *ff* into the machine *Fig.* 3. inſtead of the two arms *a a* ; the head *a* is applied to the os ilium, and the other *b* to the middle of the thigh ; but *c c* are fixed into the machine at *ff*, *Fig.* 3.

By this contrivance of *Petite* there is a counter extenſion made at the ſame time, to retain the patient while the limb is extended. Thus for the reduction of a diſlocated humerus, the arm is firſt put through the opening *a* of the machine, *Fig.* 4. ſo as to make one end *b* come over the breaſt, and the other end *c* acroſs the back, while the two holes *d d* tranſmit the two legs *a a* of the machine, *Fig.* 3. while the other end of the machine *b* is lodged upon the ground. In this machine there are ſeveral pullies *cc*, *cc*, as in the polyſpaſton of *Tab.* I. round which pullies paſſes the rope *dd* wound up by a handle *e*. But that the arm may be better extended, he uſes a peculiar ſling *aa*, *Fig.* 5. made of ſoft and double leather, fourteen inches long; this he faſtens ſtrongly round the lower part of the os humeri, a little above the elbow, the ſkin being firſt pulled upwards: it is to be kept firm upon the limb by the means of a ſilken cord, three quarters of an ell long, ſewed in a particular manner to the leather of the ſling, and to be faſtened by a knot at the two ends *b b*: to this ſilken cord is faſtened another ſling *c d e*, by two moveable loops *f f*, to which is to be annexed the rope *d d d*, which paſſes round the pullies of the machine. The apparatus being all rightly fitted, the aſſiſtant is order'd to wind up the rope by the handle *e*, *Fig.* 3. the rope becomes by that means ſtretched, and the arm to which it is faſtened is gradually extended. In the mean time the ſurgeon directs the head of the humerus with his hands, that it may again obtain its natural place, which it very often does of its own accord without further aſſiſtance.

Tab. L

fig. 1

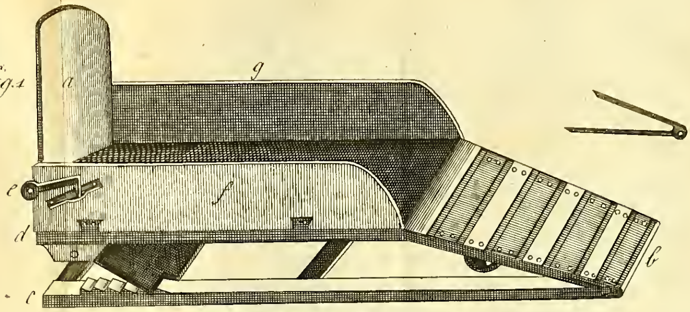
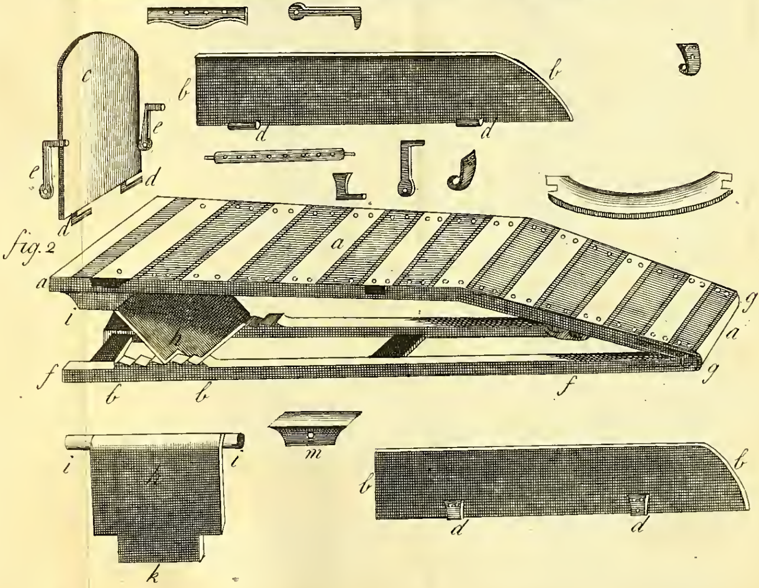


fig. 2



But to apply this machine for reducing a diſlocation of the thigh forward and downward, or backward and upward, the ſupport *Fig.* 4. is not required to be ſo broad, and it may be made without the opening *a*, as the thigh is not to be tranſmitted through it; but the middle thereof is to be applied to the tubercle of the iſchium, one end being folded behind, and the other before. The patient is to be placed on his ſound ſide, that the luxated thigh may lie upwards; but the machine itſelf is to be placed between the thighs, the knee of the diſtorted ſide being a little bent. The ſling, *Fig.* 5. is to be faſtened firmly round the lower head of the thigh above the knee, the ſkin being firſt drawn tight upwards, as we adviſed before in a luxation of the humerus; it is then to be firmly faſtened to the rope *dd* paſſing round the wheels *cc* of the machine, *Fig.* 3. *dd.* And laſtly, the legs or horns of the machine *aa*, are to be put through the apertures in the retinaculum *dd*, *Fig.* 4. and by winding up the rope by the hand *e*, *Fig.* 3. it is to be gradually extended, till the ſurgeon perceives by the limb that it is ſufficient.

TABLE L.

Repreſents the fracture-box of M. *Petite*, a celebrated ſurgeon of *Paris*, deſcribed and publiſhed by him in *Mem. Acad. Reg. Paris*; *Anno* 1718. deſcribed in *Q.* 179.

TABLE M.

Fig. 1. Repreſents a cupping-glaſs.

Fig. 2. A ſcalpel or ſingle ſcarificator, much uſed in *Germany*, but not among us. *a* the handle, *b* the edge, *c* the part which is ſtruck very quick with the end of the finger to wound the ſkin.

Fig. 3. Repreſents the order or poſition of the inciſions made in the ſkin by the cupper, that they may be all of them intercepted by the cupping-glaſs, *Fig.* 1.

Fig. 4. Exhibits the modern ſcarificator now univerſally uſed, makes ſixteen inciſions in the ſkin with little pain, by one ſtroke in the order of *Fig.* 3.

Fig. 5. Repreſents a pair of pliers for pinching up the ſkin in the neck in order to make a ſeton, by paſſing the ſeton needle marked *a*, *Tab.* G. through the opening of the pliers *b*, which are held faſt upon the ſkin by the gripe *a*.

Fig. 6. Repreſents another pair of pliers, for the ſame uſe.

Fig. 7. Repreſents the manner of ſecuring a fractured arm with ſplints and compreſſes *a a a*, tied over the bandage by the ſtrings *b b b*; with knots on the outſide of the arm, and ſuſpended by the ſling or napkin about the neck *c c c* tied in a knot upon the ſhoulder *d*, and ſuſtaining the paſteboard caſe *e*, for a fracture of the cubitus, this laſt being unneceſſary in a fracture of the humerus.

Fig. 8. Repreſents a ſtraw caſe, with the manner of fixing it to a fractured leg: *a a a* denote two

Tab. M

fig. 1

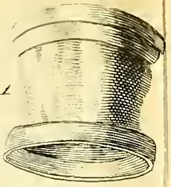


fig. 3

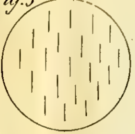


fig. 4

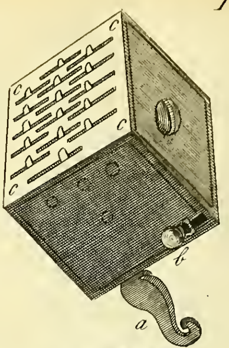


fig 2

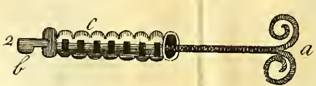


fig. 5

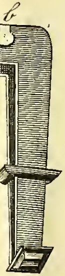


fig. 6

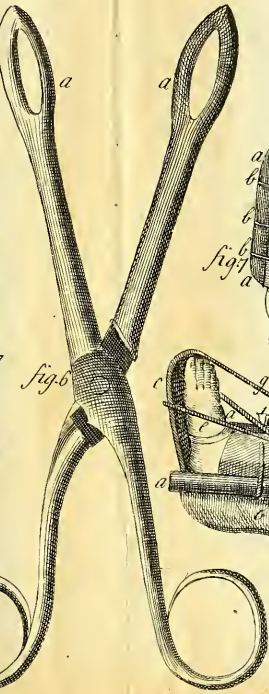


fig. 7

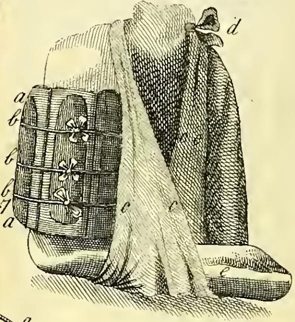
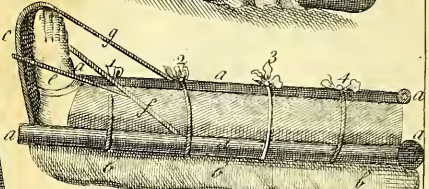


fig. 8



Tab. N

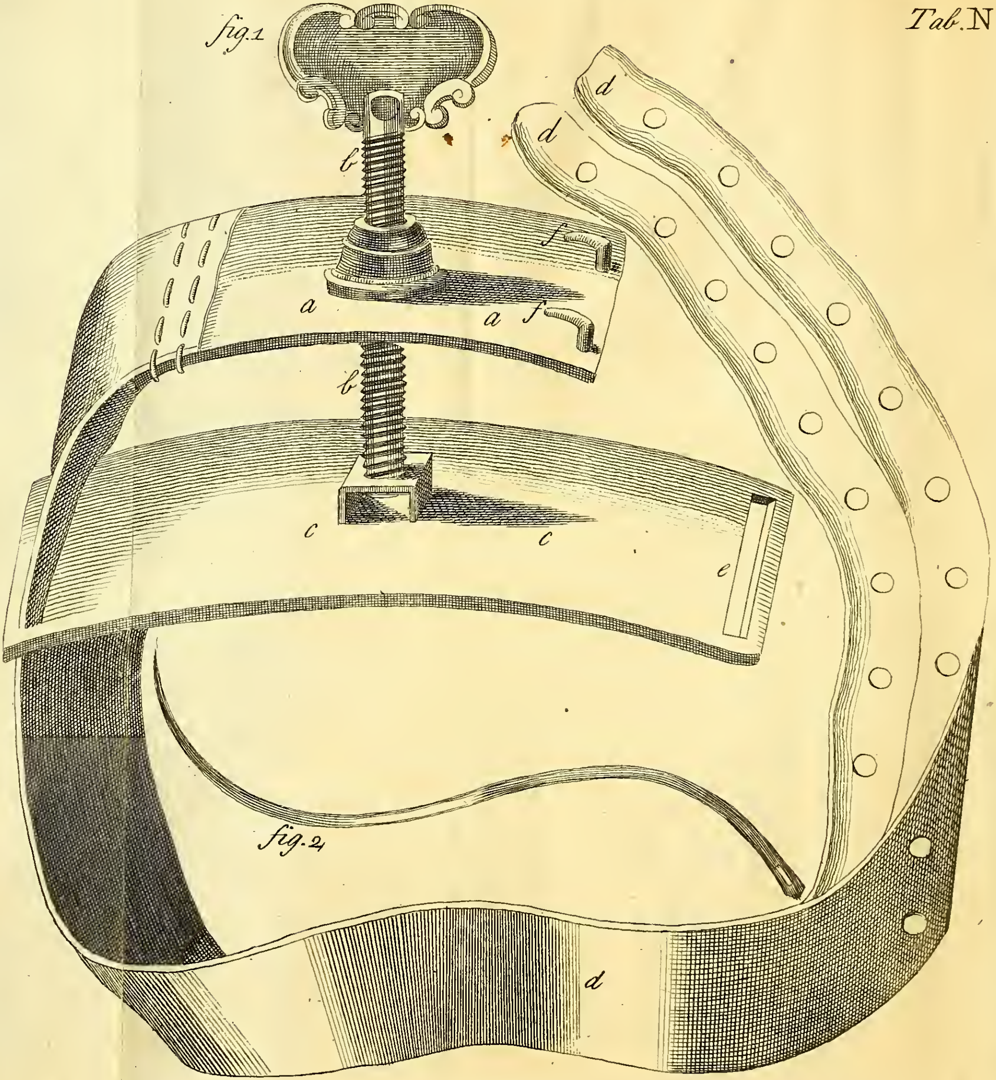
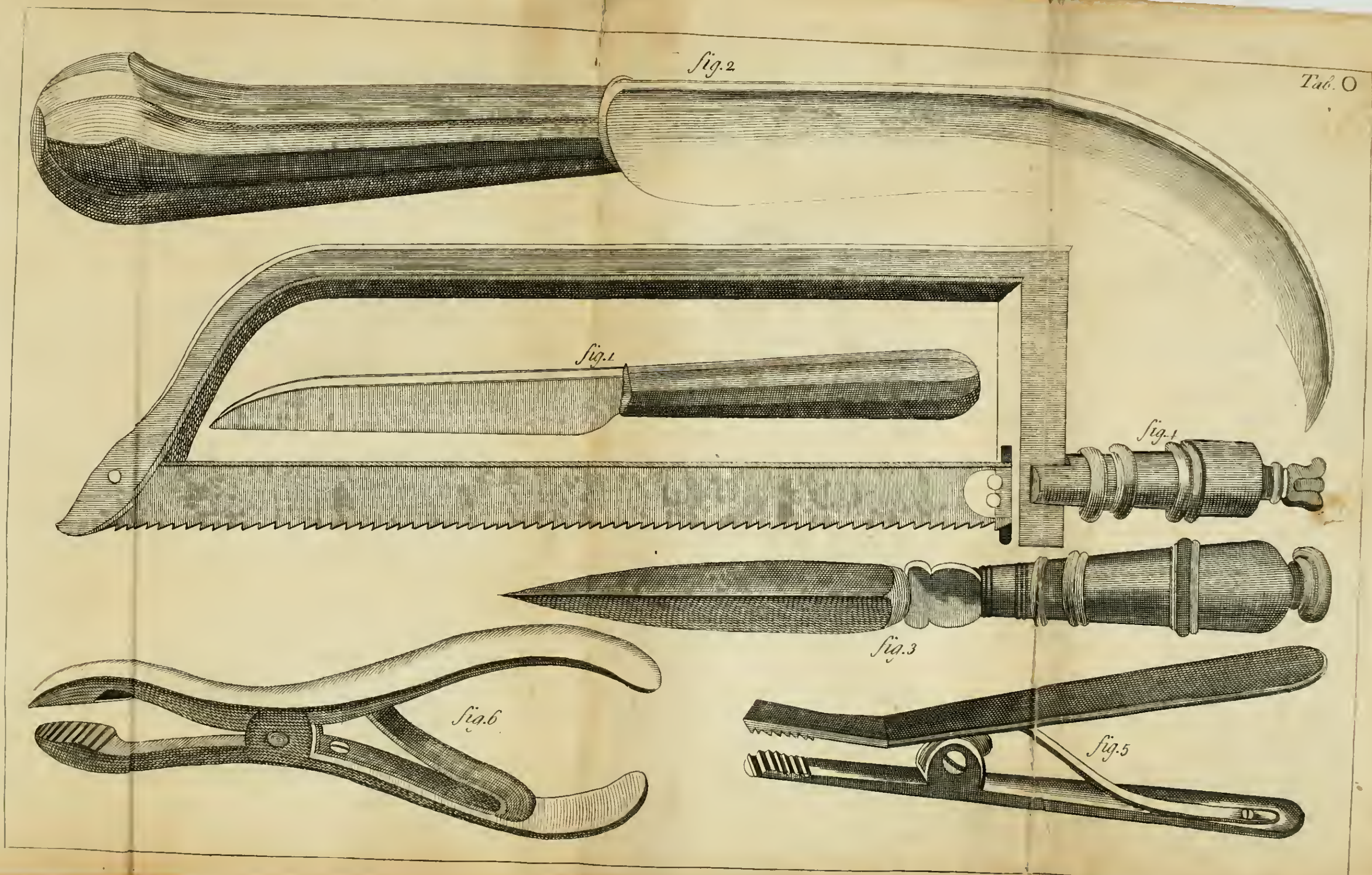


fig. 1

fig. 2

Tab. O



two junks or cylindric bundles of ſtraw, with a ſtick in the middle of each; *bbb* the ſubjacent pillow; *c* the foot-board; 1, 2, 3, 4. tapes by which the whole is tied faſt to the leg by as many knots on the outer ſide; *efg* the ligatures faſtening the foot-board to the ſtraw junks on each ſide.

TABLE N.

Fig. 1. Repreſents a braſs tourniquet after the manner of M. *Petite.* *aa* a braſs plate a little incurvated, *bb* a ſtrong braſs ſcrew, *cc* the moveable plate likewiſe a little incurvated, which immediately compreſſes the artery; *dd* a ſtrong leather belt faſtened to the upper plate *aa*, and paſſing through the opening *e* of the lower plate *cc*, and fixed by the holes to the two hooks in the upper plate marked *ff*. This inſtrument is one of the firſt uſed in the operation of amputating the upper and lower extremities.

TABLE O.

Repreſents the inſtruments for amputations of the upper and lower extremities.

Fig. 1. Denotes a ſmall ſized ſcalpel, more commodious for dividing the ſkin and fleſh in amputations than the large crooked one following.

Fig. 2. A large crooked or falciform knife, commonly uſed for dividing the fleſh to the bone in amputations of the upper and lower extremities, though in many caſes the ſmall one preceding is preferable.

Fig. 3. Repreſents a catlin or double-edged ſcalpel for dividing the fleſh and ligaments betwixt the bones of the cubitus and leg. This knife is alſo uſed in the method of amputating the tibia, which preſerves the calf.

Fig. 4. Repreſents the ſaw uſed for amputating bones of the limbs. This inſtrument is often made as large again as the figure; but we find that one of the ſame ſize, or but little larger than the figure, will perform the operation as well, or even more commodiouſly than a larger.

Fig. 5 and 6. Repreſent pliers furniſhed with ſmall teeth at one end, and a ſpring within the handle, ſerving to take hold of the ends of the divided arteries, in order to ſecure them by ligature to ſuppreſs the hæmorrhage, after amputations of the upper and lower extremities.

TABLE P.

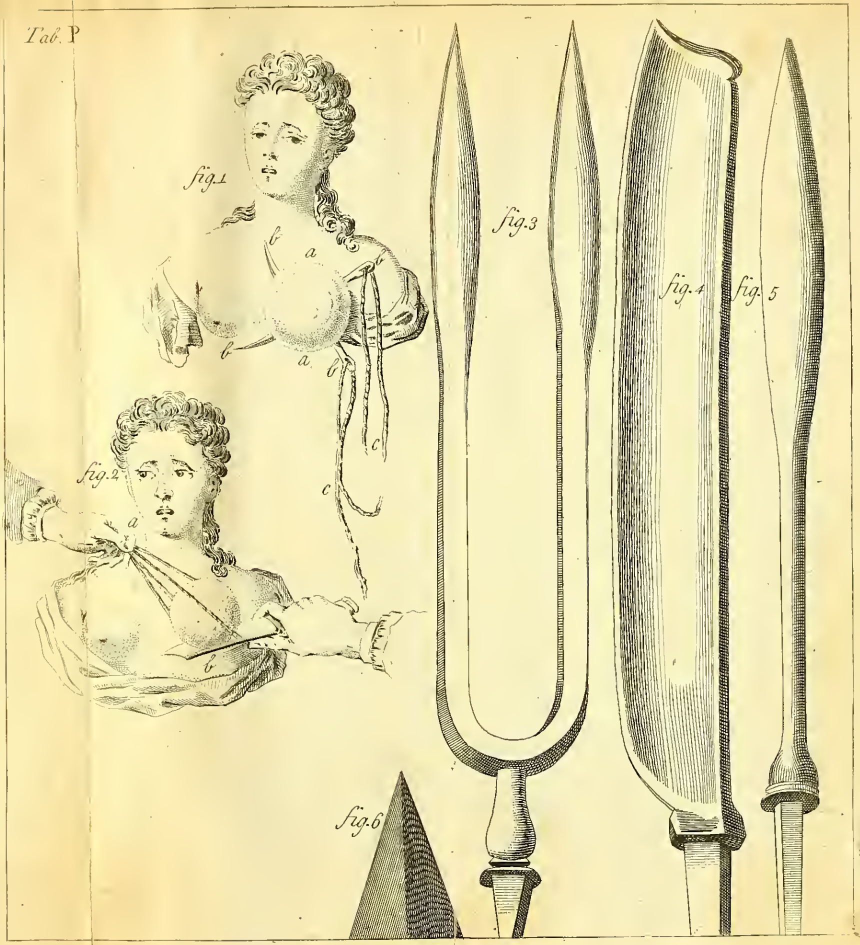
Repreſents the inſtruments for extirpating cancerous breaſts.

Fig. 1. Shews the old method of extirpating a cancer by raiſing it with large needles *b b*, armed with threads *c c*.

Fig. 2. Shews the manner of faſtening the preceding threads in the hand *a a*, to elevate and amputate the cancer with a long knife *b*.

Fig. 3. Is a fork propoſed by *Solingen* and *Bidlow*, to elevate the breaſt, and amputating cancers.

Tab. P



Tab. 9

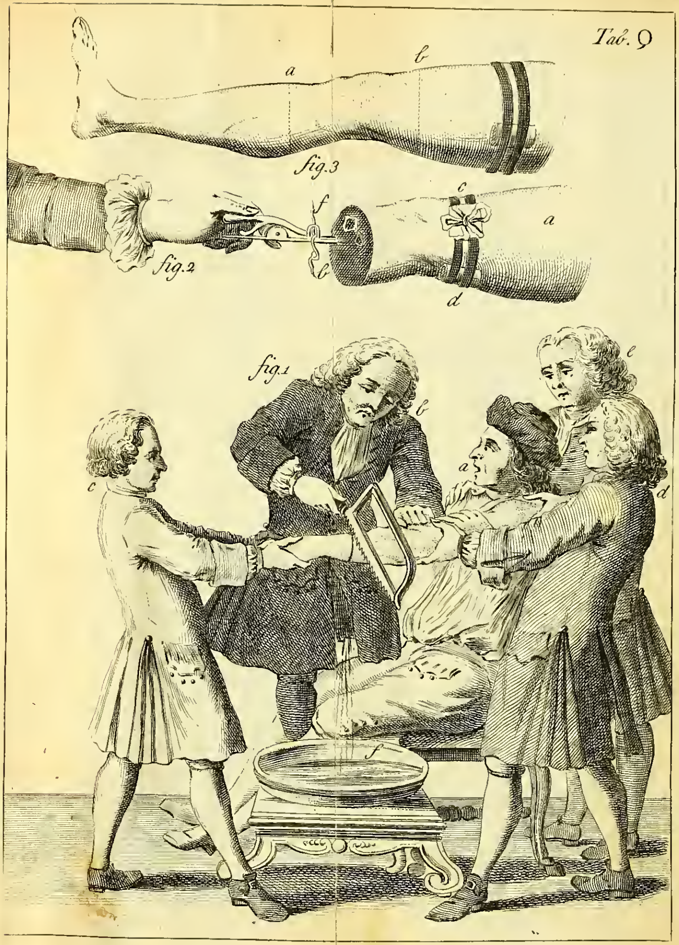


Fig. 4. A large amputating knife for this operation.

Fig. 5. Is a ſingle fork of *Bidlow*, like a ſword, for elevating cancerous breaſts.

TABLE Q.

Fig. 1. Repreſents the manner of amputating the hand or arm, with the manner of placing the aſſiſtants and ſurgeon. *a* denotes the patient, *b* the ſurgeon amputating with a ſaw, *c* the aſſiſtant extending the hand, *d* another aſſiſtant holding the arm, *e* the aſſiſtant who holds the patient's body, and takes care of the tourniquet; *f* the diſh or veſſel placed underneath to receive the blood.

Fig. 2. Repreſents the thigh marked *a*, with the leg amputated *b*, in which may be ſeen the tourniquet *c d*, in order to amputate the foot in the tarſus or metatarſus, and alſo for amputating the leg or thigh; though for the latter the tourniquet may be more conveniently placed higher up. In this figure you have alſo a view of the divided artery extended a little by the pliers *e*, in order to be tied by the ligature or knot *f*. There are ſome indeed, who think this method of ſecuring the arteries by ligature not ſufficiently ſafe, whereas it is found by experience to anſwer very well, provided the ligature be not too ſmall, but of ſome breadth, to prevent it from cutting thro' the coats of the artery; and at the ſame time you by this means avoid the fatal ſymptoms which are often brought on when the nerves together with the circumjacent fleſh are conſtringed along with the veſſel, in the way of making ligatures by the needle; and this is a circumſtance which ought to be guarded againſt with all poſſible care, as convulſions and even death itſelf may be the conſequence of ſuch a ſtricture upon the nerves, when the ſurgeon does not in the leaſt ſuſpect the real cauſe.

Fig. 3. Repreſents the moſt convenient part for amputating the leg at the mark *a*, and the thigh at the mark *b*. But when the diſorder has extended itſelf higher up in the thigh, the amputation muſt be made proportionably above this mark, though the operation then becomes the more dangerous.

TABLE R.

Fig. 1. Repreſents the poſition of the ſurgeon, patient and aſſiſtants, for amputating the leg. *a* the patient ſeated in a chair, *b* the ſurgeon, *c* the aſſiſtant holding the foot below the calf, *d* the aſſiſtant holding the leg above the knee, *e* the veſſel placed on the floor to catch what little blood may be ſpilt in the operation.

Fig. 2. Repreſents the manner of amputating the leg, ſo as to preſerve the calf to fold over the extremities of the bones, *ab* denotes the firſt inciſion to be made by the two-edged ſcalpel repreſented in *Tab.* O. *Fig.* 3. *bc* the courſe of the ſecond inciſion, by which the fleſh of the calf is ſeparated from the bones of the leg. *cd* the place where the bones of the leg are amputated. Some indeed reverſe this courſe of the inciſion, and firſt perforate the calf with the two-edged ſcalpel, according to the line *c*, and then they direct the knife in the courſe *ba*.

Tab. R

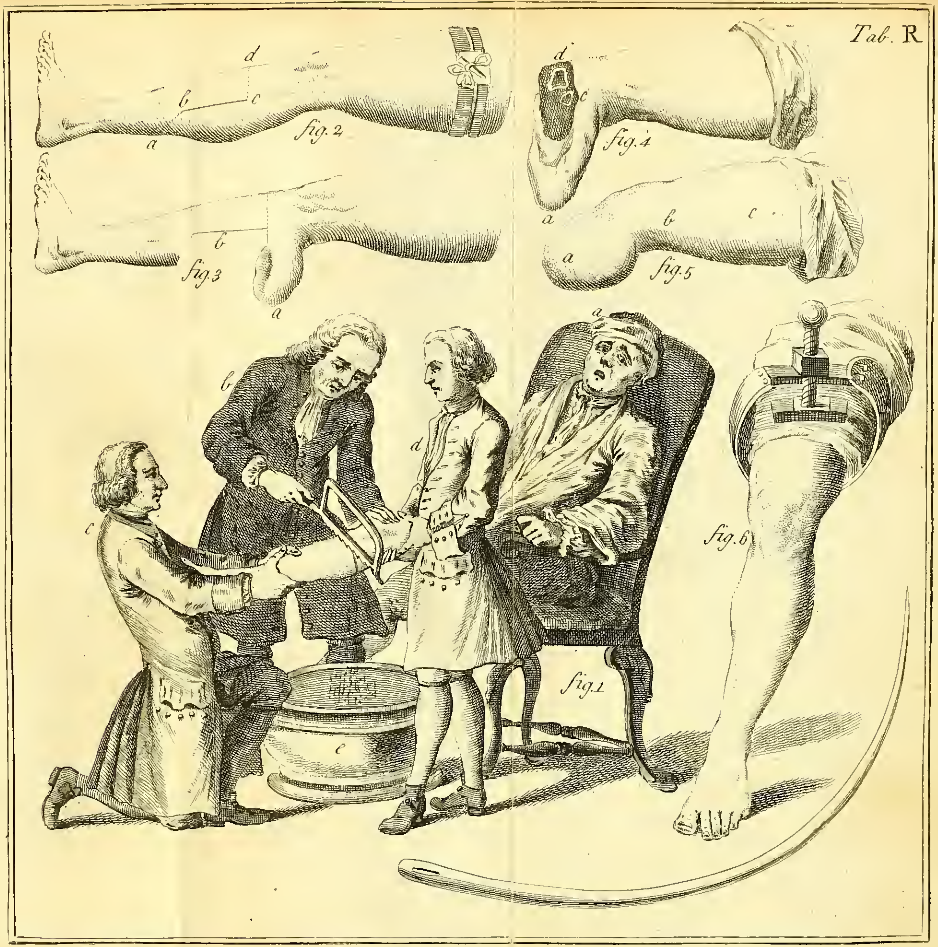


Fig. 3. Shews the manner of reflecting back the calf of the leg towards the ham, after it has been ſeparated from the bones by inciſions; which done, the ſurgeon next divides the integuments, fleſh and perioſteum in the line *b*, and then ſaws through the bones in the ſame place.

Fig. 4. Repreſents a leg juſt amputated in this manner, with the calf *a* depending, ſo that one may ſee the ends of the bones; *b* the tibia, *c* the fibula.

Fig. 5. Repreſents a leg thus amputated with the calf *a* brought over and joined to the ſtump *b*, *c* denotes part of the thigh.

Fig. 6. Repreſents the manner of fixing the ſcrew-tourniquet, *Tab.* N. upon the thigh before amputations, *&c.*

TABLE S.

Fig. 1. A repreſents the grand kerchief or capital bandage uſed after trepanning, and in wounds of the head, but repreſented more particularly by *Fig.* 2. — BC repreſent the napkin and ſcapulary. D the manner of applying the ligature after bleeding in the arm. E denotes the bandage called a ſtirrup to be applied after bleeding in the foot. F G repreſent the oblique ſpiral courſe in which bandages ought to be applied upon the leg or arm, that they may ſit firm upon the limb without ſubſiding. H a tranſverſe wound of the thigh, the lips of which require to be retained by the true ſuture. I the part of the arm where the tourniquet is applied: the compreſs I being fixed within-ſide the arm, the ligature is drawn tight by twiſting the turn-ſtick K, which is ſecured from pinching the fleſh by a piece of paſteboard. L M ſhew the common tourniquet applied to the thigh in the manner which is neceſſary when the leg is to be taken off above the knee. N repreſents the tourniquet fixed upon the lower part of the thigh; as when the leg is to be taken off below the knee.

Fig. 2. Repreſents the grand kerchief applied after trepanning, and in wounds of the head. It is made with a napkin folded one third over the other, after which it is applied with the middle upon the head, ſo that the edge may extend almoſt to the eyes, and the corners hanging over the cheeks, the two uppermoſt of the narrow part are tied under the chin *a a a*; but the anterior corners of the lower and largeſt fold of the napkin are carried back and round the occiput *b*, and faſtened on each ſide near the ears. *c c* repreſent the poſterior angles brought from the occiput to the forehead, and there faſtened by the knot *d*; *e e* the middle of the bandage inveſting the head.

The next bandage ſerving for the hydrocephalus, and for the ſame purpoſes with the preceding, is termed capeline, repreſented and deſcribed before in *Tab.* E. *Fig.* 14.

Fig. 3. Repreſents the knotted bandage to be applied after opening an artery in the temples, or after the extirpation of a ſcirrhous parotid gland, or a wound, *&c.* It conſiſts of a double-headed roller five or ſix ells long, and of two fingers breadth, applied with the middle to the ſound temple oppoſite the wound; then carrying the

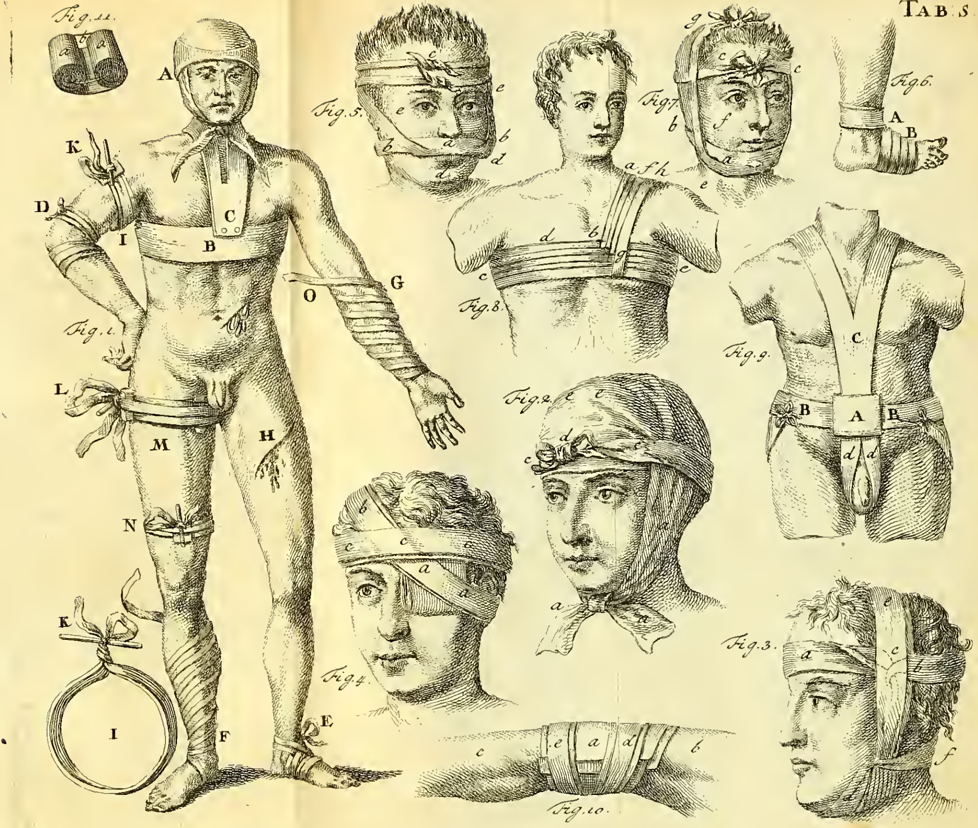


Fig. 11.
a b a
A
K
D
C
I
B
O
G
Fig. 1.
L
M
H
N
K
I
F
E
Fig. 5.
c e e b b a b d d
Fig. 8.
a f h d b g c e
Fig. 7.
g c c b f a e
Fig. 6.
A B
Fig. 9.
C B A B d d
Fig. 2.
e e d c a a
Fig. 4.
b c c c a a
Fig. 3.
a e c b f d
Fig. 10.
c e a d b

two roller heads *a* and *b* to the other temple, they are croſſed ſo as to form the knot *c* upon the dreſſings, from whence one roller is carried under the chin *d*, and the other over the vertex of the head *e* to the ſound temple, where they are croſſed, and the like courſe repeated as before.— But after the extirpation of a ſcirrhous parotid, *&c.* the bandage is applied with its middle on the ſound ſide; and after the firſt circumvolution about the head as before, the perpendicular courſe of it *de* is oftener repeated, and inſtead of making the knots or croſſings upon the temples, they are here fixed upon the parotid or wounded part under the ear *f*, ſecuring the extremities of the bandage by ſuture.

Fig. 4. Repreſents the bandage for diſorders of the eyes, which is termed either monoculus or binoculus, according as it inveſts either one or both eyes. The firſt is made with a ſingle-headed roller about three ells long, and of two fingers breadth, applied with the end upon the occiput; from whence it is carried obliquely round over the dreſſings *a a*, and over the forehead *b* to its origin at the occiput. This courſe being thrice repeated, the reſt of the bandage terminates circularly about the head *c c c*. The binoculus is made by repeating the ſame oblique courſe of the bandage upon the other eye *a a b*, before it terminates circularly about the head *c c c*.

Fig. 5. Repreſents the bandage for the harelip; *a* its middle, which is not ſlit; *bb* its two upper heads, which are tied upon the forehead at *c*; *dd* its lower heads, which being carried obliquely over the cheeks *ee*, are croſſed upon the occiput, and then faſtened by a knot on the forehead under the former.

Fig. 6. Repreſents the manner of applying the bandage after bleeding, a fracture, or luxation in the foot: A the circular rounds about the ancle: B the ſpiral and circular turns about the tarſus and metatarſus.

Fig. 7. Repreſents the bridle for a fracture or diſlocation of the lower jaw, the middle part having an opening is applied to the chin *a*; after which the two upper heads are carried round *b*, and croſſed on the occiput; from whence being brought over the forehead *cc*, they are tied in a knot; but the two lower ends of the bandage *e* are carried up by the ſides of the cheeks *f*, and faſtened with a knot *g* upon the crown of the head, or elſe carried down again, and tied under the chin.

Fig. 8. Repreſents the reflexed bandage for a fracture of the clavicle, conſiſting of a double-headed roller of ſix ells in length, and three fingers breadth, applied with the middle over the dreſſings to the top of the affected ſhoulder *a*, ſo as to paſs obliquely over the præcordia *b*, while the poſterior roller-head croſſing the back obliquely, comes round under the ſound axilla over the breaſt *d*, and paſſing over the anterior roller-head continues its courſe under the axilla of the affected ſide *e* to the back, where it croſſes again the other roller-head, which is reflected back as before at *f* upon the clavicle; and thus the ſame courſe is repeated again till the part is inveſted *g h*.

Fig. 9. Repreſents the napkin and ſcapulary bandage, as it is adapted to diſorders of the abdomen and perinæum. A compreſs fixed to the napkin and ſcapulary for an omphalocele. BB the napkin. C the ſcapulary. *dd* two ſlips of the bandage paſſing betwixt the thighs, are carried round the nates, and faſtened to the napkin or belt at BB. This ſcapulary C with its appendages *dd* will likewiſe ſuffice without the napkin BB, for retaining the dreſſings after cutting for the ſtone, or for a fiſtula in the anus, a bubo, *&c.*

Fig. 10. Repreſents the delegation for a tranſverſe fracture of the patella. *a* the patella, *b* the thigh, *c* the leg, *de* the turns above and below the patella, croſſing in the ham like the figure 8.

Fig. 11. Repreſents a double-headed roller ſewed together at each end, ſo as to leave a ſpace in the middle *b* for ſuſtaining the heel and tendo *Achillis* in fractures, and for retaining the patella in a perpendicular fracture of it.

TABLE T.

Fig. 1. Repreſents the bandage for retaining the dreſſings after an amputation of a cancerous breaſt. A B C D denote the firſt courſe of the roller, which is repeated ſeveral times, and terminated circularly upon the dreſſings E F.

Fig. 2. Repreſents the ſimple ſpica bandage for injuries in or near the ſhoulder and axilla. The middle of the bandage is fixed under the ſound axilla *a*, and aſcending croſs the back and breaſt *b* to *c*, the roller-heads there croſs and paſs under the axilla *d* of the affected ſhoulder, upon which it riſes again and is croſſed at *e*, thence deſcending to the axilla *a*, and the ſame courſe repeated as before.

Fig. 3. Repreſents the ſpica inguinalis ſimplex, beginning with a double-headed roller at *a*, carried in the courſe *b b* to *c*, and thence by *e d*, and up again to *c*; and thence again to its origin at *a*, ſerving for inteſtinal ruptures, a luxation of the femur, a fracture of its neck, or of the os ileum.

Fig. 4. Repreſents the double-knotted bandage, ſerving chiefly to reſtrain the hæmorrhage after cutting for the ſtone, and the fiſtulæ of the anus. The middle of the roller is applied firſt over the perinæum, thence according to *b c*, where being croſſed, the roller heads are carried over the abdomen and back *d* to *e*, croſſed and carried along *f* to *g*, where the roller heads change hands, and form a knot like that for arteriotomy, *Tab*. S. *Fig*. 3. and the ſame courſe repeated as at firſt. But to make the bandage ſtricter, the rollers may be carried obliquely upwards over the ſhoulders in the courſe repreſented by the two pricked lines.

Fig. 5. Repreſents the bandage for inveſting the ſcrotum, called a bag-truſs; *a a* the tranſverſe part that goes round the body, *b b* the perpendicular part with the aperture *c* to tranſmit the penis.

Fig. 6. Repreſents the glove-bandage for a burnt or ſcalded hand, made with a piece of tape

TAB: T.

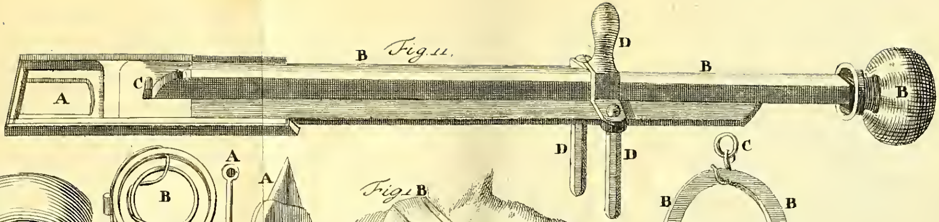
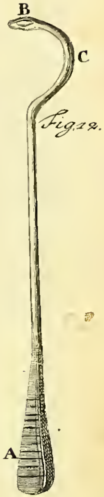


Fig.11.
A
B
C
B
D
B
D
D


B
C
Fig.12.
A

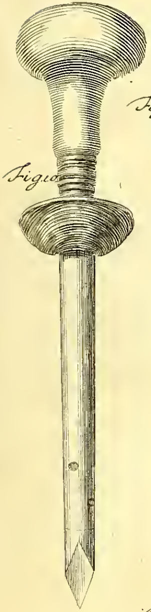


Fig.10.

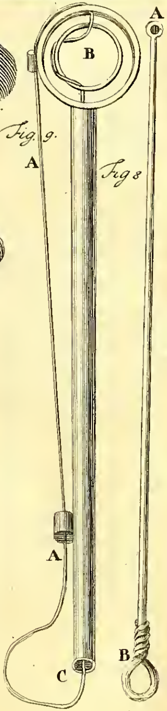
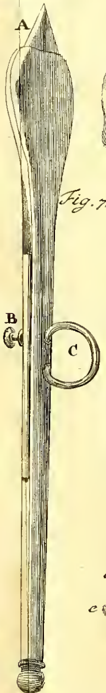


Fig.9.
A
B
Fig.8
A
A
C
C
B


A
Fig.7.
B
C

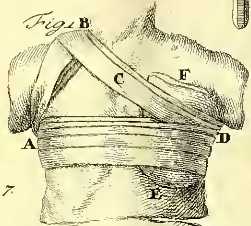
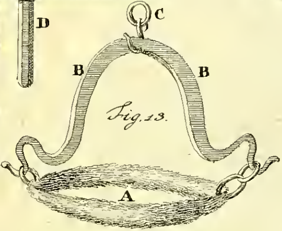


Fig.1.
B
C
F
A
D
E


C
B
B
Fig.13.
A

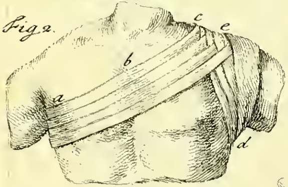


Fig.2.
c
e
b
a
d

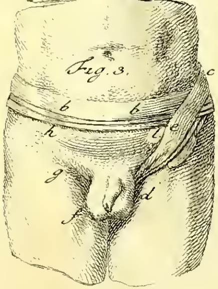
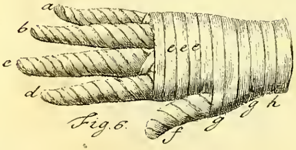


Fig.3.
c
b
b
h
e
g
d
f


a
b
c
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eee
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g
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Fig.6.

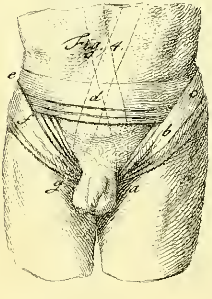
Fig.4.
e
d
f
b
g
a

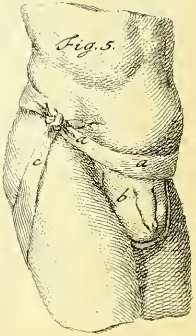
Fig.5.
a
c
a
b

ſix ells long and an inch broad, begun upon the carpus *h*; whence it is carried acroſs the palm to *a*, which is the firſt inveſted by a ſpiral aſcending and then deſcending turns, thence to *b c* and *d* in the ſame manner; from which laſt it goes circularly about the metacarpus *eee*, then about the thumb *g f*, and from thence terminating circularly about the carpus *g h*.

Fig. 7. Repreſents the pariſthmiotomus for ſcarifying the tonſils when inflamed, or opening them when ſuppurated. A the concealed ſcarificator, B the handle by which it is moved forward, C the handle of the inſtrument by which it is held.

Fig. 8 and 9. Repreſent a braſs inſtrument contrived by *Hildanus* to extirpate a diſeaſed uvula by ligature. A A, *Fig.* 9. denote the thread or ligature properly diſpoſed and faſtened in the inſtrument, B the loop of the ligature which intercepts the uvula, C the part of the ligature which is to be drawn by the hand. *Fig.* 8. denotes a wire of ſteel or braſs for tranſmitting the ligature through the cannula of the preceding inſtrument. A the aperture which tranſmits the ligature, B the handle.

Fig. 10. Repreſents a trochar or ſteel triangular-pointed bodkin included in a ſilver cannula, for making the paracenteſis of the abdomen to diſcharge the water in a dropſy: they ought exactly to fit each other, and the edge of the cannula ſhould be rounding towards the bodkin or perforator, to make it enter the more eaſily.

Fig. 11. Repreſents an inſtrument for amputating the uvula: A the part which is to receive the uvula, B B the handle by which the blade C is thruſt forward to A to cut off the uvula, D D D denote the handle of the whole inſtrument by which it is to be held.

Fig. 12. Repreſents an inſtrument contrived to paſs a ſtring round the root of a polypus to remove it by ligature: A the handle, B C the eye and curvature.

Fig. 13. Repreſents an inſtrument to ſwing children by the head to ſtraighten the wry neck, or a crookedneſs of the ſpine: A the collar lined with fur; B B an iron arch admitting the head, and ſuſpended by the ring C, by which the patient is lifted up from off the ground.

TABLE U.

Fig. 1. Repreſents a needle fixed in a handle and armed with a ligature, which is to be paſſed through the tonſil in order to its extirpation, when the baſis is larger than the extremity: but when the apex of the tonſil is larger than the baſis, it may be extirpated by the ligature applied by the inſtrument *Fig.* 9. *Tab.* T. ſuppoſing the ring which ſupports the loop B to be bent perpendicular to the horizon, inſtead of being parallel with the handle of the inſtrument A A.

Fig. 2. Repreſents the model of a ſpeculum oris to depreſs the tongue, in order to view the tonſils, uvula, *&c.*

TAB. U.

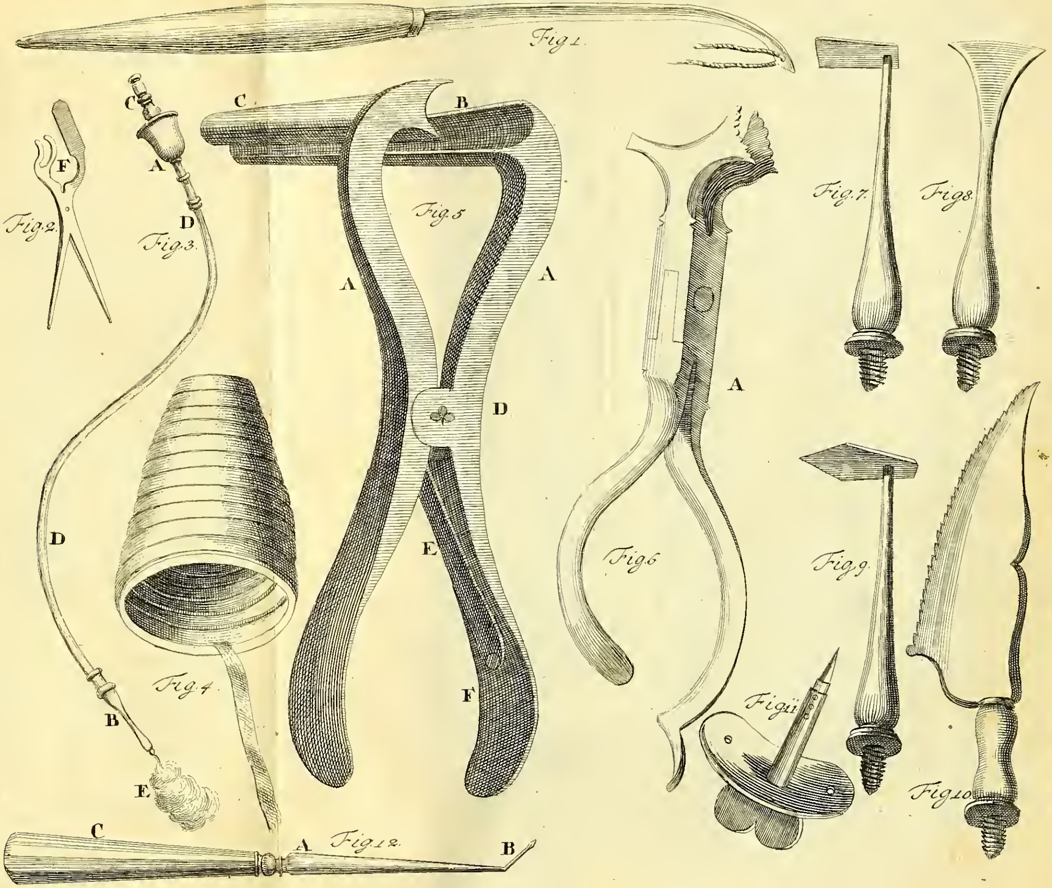
Fig. 1.
C
C
B
A
F
Fig. 2.
D
Fig. 3.
Fig. 5
A
A
Fig. 7.
Fig. 8.
A
D
D
E
Fig. 6
Fig. 9.
Fig. 4.
B
F
Fig. 11
E
Fig. 10.
C
A
Fig. 12.
B

Fig. 3. Denotes a fumigating machine. A repreſents an iron box, the lid of which unſcrews for the reception of an iron heater, which being heated red in the fire, and ſuffered to cool till it appears dark, is then placed in the box, the lid C ſcrewed on, and cinnabar poured in upon the heater; after which the ivory pipe *b* is fixed in and applied to the mouth, which by blowing forces the fumes through the iron box and pipe A, and through the leathern pipe D D, till it is diſcharged at E by the ivory tube B. Thus the fumes are concentrated into a ſmall compaſs, ſo as to act more effectually upon a ſhanker, an old ſore or venereal ulcer, *&c.* in which the efficacy of cinnabarine fumigations is very great, in order to diſpoſe the parts for healing. The pipe D D may be commodiouſly made of the ureter of an ox or ſheep inflated or dried. This inſtrument will likewiſe ſerve for making other fumigations with ſulphur, gums, ſalts, *&c.* and it will likewiſe ſerve to adminiſter a clyſter of the ſmoke of tobacco, ſuppoſing the heater to be taken out, and the tobacco fired in the iron box A, the ſmoke being blowed by the mouth through the pipe D D and B into the anus. It may be alſo uſed for blowing moiſt or dry fumes into the ear, *&c.*

Fig. 4. Repreſents an elaſtic peſſory or ſteel wire turned into a conical worm, and covered over with bees-wax, having a ſtring faſtened to the baſis for its extraction. It is very uſeful for ſuſtaining a bearing down of the uterus or vagina.

Fig. 5. Denotes a ſpeculum ani, conſiſting of a hollow cone B C, which being gently warmed and lubricated with oil, is then introduced into the anus or vagina, and the ſides of the cone gradually open for inſpection, by preſſing on the handles F F turning upon the hinge D, and furniſhed with the ſpring E.

Fig. 6. Repreſents a pair of forceps contrived to take out the circular piece of bone, which has been cut from the reſt of the ſkull by the crown of the trepan, or of the trefine. The extremities of the forceps *a a* are to be made conformable to an arch of the ſame circle with that of the ſaw or crown of the trepan. *b* denotes a ſmall elevator affixed to one handle of the inſtrument.

Fig. 7, 8, 9. Repreſent different kinds of ſcraping chiſſels for the cranium, to be ſcrewed into a convenient handle.

Fig. 10. Repreſents a ſmall fine ſaw of a convex figure, for dividing fragments or aſperities of the ſkull.

Fig. 11. Repreſents a ſmall kind of trochar for performing the operation of bronchotomy. In the wings of the cannula are two holds, by which it is to be tied round the neck; and within ſhould be contained another cannula, which may be taken out and cleaned upon occaſion from the mucus or moiſture which is apt to obſtruct it. The length of the cannula ſhould be about an inch, more or leſs, in proportion as the incumbent parts upon the windpipe are more or leſs diſtended and ſwelled, and its ſhape may be made rather oval or elliptical than perfectly round.

Fig. 12. A ſteel inſtrument to cauterize a hollow aching tooth, and fill it up with leaf gold or lead, to exclude the air and aliments which cauſe their bony part to rot and decay.

TABLE X.

Fig. 1. Repreſents a common couching needle for depreſſing a cataract or opake cryſtalline lens to the bottom of the vitreous humour, as repreſented in *Tab.* 2. *Fig.* 5. The broad part of the needle at the point is flat on one ſide, but a little convex on the other to give it a greater ſtrength, as in a lancet tending to a ſharp edge. The handle is ivory tinged with a ſtripe of black upon that ſide which is even with the convex ſurface of the blade, that by holding the black part of the handle upwards when the point of the needle is in the eye, one may be guided to depreſs the cataract by the flat ſurface of the needle when it cannot be ſeen through the pupil.

Fig. 2. Repreſents a figure of the human eye: *a* the oblique poſition of the optic nerve; *b* the poſterior cavity of the eye which is filled with the vitreous humour; *c* the true figure of the cryſtalline lens included in its membranous capſule, from whence go off obliquely the ciliary proceſſes or ligaments on each ſide; *d* the iris perforated by the pupil *f*, and ſuſpended in the midſt of the aqueous humour, which diſtends the cornea *e*. The ſpace occupied by the aqueous humour is diſtinguiſhed into two chambers, which bear a great diſproportion the one to the other: the anterior chamber, before the iris and next the cornea, being much larger than the poſterior chamber next the cryſtalline lens and behind the uvea.

Fig. 3. Repreſents the canalis naſalis, which conveys the tears from the eyes into the noſe; *b b* the lachrymal points opening in the upper and lower eye-lid; *c c* the lachrymal ducts which lead from the puncture to the ſack *a d*, which opens into the naſalis canalis *d d e*.

Fig. 4. Denotes a ſmall ſilver ſyringe A, to which is adapted the pipe B, with a capillary tube *b*, to be introduced into the puncta lachrymalia, for injecting warm water, or ſome other deterging liquor, in order to cleanſe and heal thoſe paſſages into the noſe, when they are obſtructed or ulcerated in the fiſtula lachrymalis. C denotes a ſmall capillary probe of gold or ſilver wire to be introduced by the puncta lachrymalia, *Fig.* 3. *b b* through the lachrymal ducts *c c* into the noſe by the canal *d e*, for clearing the paſſages when the reſiſtance is greater than will give way to the force of an injected fluid.

Fig. 5. Repreſents a ſpring ſpeculum oculi made of ſilver or ſteel, capable of opening more or leſs by the button B, which ſlides along a ſlit in the handle, to ſupport the eye-lids in couching, ſcarifying, or performing any other operation upon the eye. The inſtrument is made ſo as to fly open by its own elaſticity, if the branches of the handle were not confined by the button B.

Fig. 6. Repreſents the ſituation of the lachrymal points *a a*, ducts *c c*, and ſack *d*, with the naſal canal *e f*, as they are diſpoſed with reſpect to the

TAB. X.

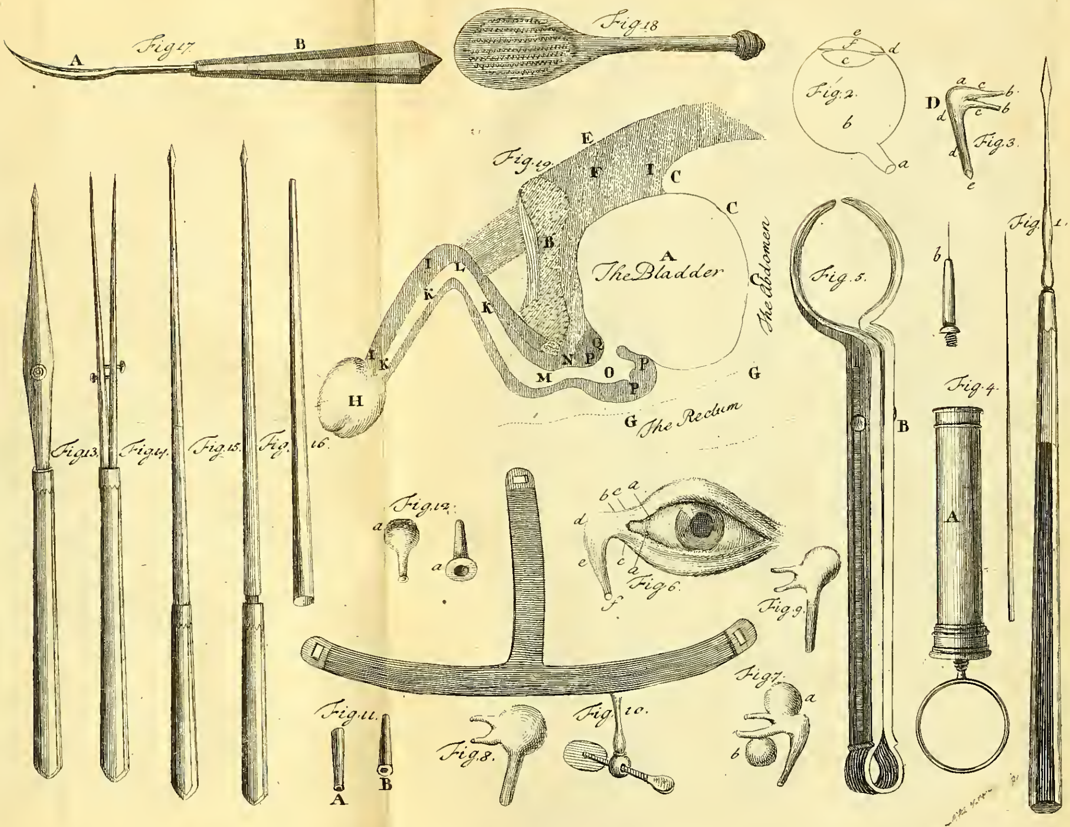
Fig. 17
A
B
Fig. 18
Fig. 2
e
f
d
c
b
a
D
a
c
b
b
c
d
d
e
Fig. 3
Fig. 19
E
F
I
C
C
B
A
The Bladder
The Abdomen
I
L
K
K
I
K
H
N
P
Q
M
O
P
P
G
G
The Rectum
Fig. 1
Fig. 5
B
b
Fig. 4
A
Fig. 13
Fig. 14
Fig. 15
Fig. 16
Fig. 12
a
a
b
c
a
d
e
c
a
f
Fig. 6
Fig. 9
Fig. 7
a
b
Fig. 11
A
B
Fig. 8
Fig. 10

the eye repreſented before by *Fig*. 3. A lachrymal fiſtula then is an obſtruction and inflammation with or without an ulceration in ſome of theſe paſſages, whereby the tears are obliged to run down the cheek, inſtead of being abſorbed and conveyed into the noſe by the opening of the canal *f*; and therefore the ſeat of this diſorder may be either in the ducts *c c*, in the ſack *d*, or in the canal *e*.

Fig. 7. Repreſents a lachrymal fiſtula in the upper duct *a*, and in the lower duct *b*.

Fig. 8 and 9. Repreſent the ſame diſorder in the ſaccus lachrymalis.

Fig. 10. Repreſents an inſtrument for making a compreſſure upon the ſaccus lachrymalis, made of thin pliable ſteel covered with velvet, to be adapted and faſtened upon the forehead by three pieces of ribband tied about the head, ſo that the button or plate of the ſcrew may fall upon the lachrymal ſack. Mr. *Sharp*, from whom this inſtrument is taken, tells us that the branch of iron which ſupports the ſcrew muſt be ſoft enough to bend, without which it will be difficult to place the button exactly on the bag. This inſtrument he thinks capable of curing a recent fiſtula barely by compreſſure, or at leaſt that it ought to be tried before the operation.

Fig. 11. Repreſents ſmall tubes of lead or gold A B, which are propoſed by ſome to be left in the parts, to continue a paſſage from the eye into the noſe; but it does not ſeem practicable to heal the membranes as long as theſe tubes are left in.

Fig. 12. *a a* repreſent ſilver tubes to keep open the new-made paſſage into the noſe after the operation for the fiſtula lachrymalis, till the paſſage is become callous or cicatrized.

Fig. 13. Repreſents a new kind of couching needle invented by Mr. *Cleland* (*Phil. Tranſ.* N° 461. p. 844.) You have here both a front and a lateral view (*Fig.* 13.) of this inſtrument, which differs from the common couching needle in this, that it is made up of two pieces of ſteel ſoldered together, and fixed in a handle; at a little diſtance from the handle they ſeparate, and have in each lamina a button fix'd, which paſſes through a hole in the other; from this part to the points they are ſo nicely applied and poliſhed together, that they cut, and have the ſhape of a common needle. Upon preſſing the buttons, the points are ſeparated; and in the inſide of the broad part of the points are ſeveral ſmall indents, to prevent any thing from ſlipping after it has once got hold. The uſe of this needle is, either to depreſs a cataract; or, if it ſhould be found of ſuch a nature as to bear to be taken hold of, then, by opening the points, to engage it, and carefully bring it out of the eye. If it ſhould happen that in depreſſing the cataract, or in bringing it out of the eye, ſome of the ſmall veſſels are wounded, and ſome drops of blood diffuſe themſelves in the aqueous humour; this ſecond needle (*Fig.* 14.) is made with deſign to remedy this inconveniency. It is a long, ſmall, round ſtilet (*Fig.* 15.) gradually decreaſing from the handle to the point; and is fitted to a long ſilver tube of the ſame ſhape (*Fig.* 16.) into which the needle is put, and the point comes out at the end a quarter of an inch.

This is to be introduced into the eye at the orifice the other needle has made: when it is ſo far introduced, that the end of the tube is within the poſterior chamber of the aqueous humour, the needle is to be withdrawn, leaving the tube in the eye; and then with the mouth may be ſucked into the tube, all the blood and watery humour that is contained there, or any other floating particles: then the tube is to be withdrawn, and the eye left to repleniſh itſelf with the aqueous humour again, which will take twelve or eighteen hours at moſt.

Fig. 17. Repreſents a needle fixed in the handle for elevating and diſſecting ſmall blood-veſſels in the conjunctiva tunica and white of the eye; as alſo to raiſe and diſſect a pterygium or hard ſkin.

Fig. 18. Repreſents a ſcarificator, or fine ſteel raſp of a convex figure, deſigned to ſcarify the eye-lids and white part of the eye in an ophthalmia.

Fig. 19. Repreſents a ſection of the bladder and Urethra, as they appeared by injecting them with wax; an idea of which is very neceſſary to be had, in order to paſs a catheter or ſtaff to ſearch or cut for the ſtone, *&c.* A denotes the ſection of the bladder. B the ſection of the pubis. C the cavity of the abdomen. D the peritonæum. E the integuments of the abdomen. F the ſpace between the pubis and the peritonæum, taken up by the cellular membrane. It is the place of the inciſion in the high operation of Lithotomy. G the rectum. H the glans. I the corpus cavernoſum. K the urethra. L the elbow of the ligamentum ſuſpenſorium. M the bulb or gulf of the urethra. N the ſtreights and elbow at the entry of the gulf of the proſtate. O the gulf of the proſtate. P, P, P ſort of elbows or blind cavities found therein. Q the ſtreights of the entry into the bladder.

TABLE Y.

Fig. 1. Repreſents a female catheter, which is almoſt ſtreight, of a large bore, and adapted to diſcharge the urine, or ſearch for the ſtone in women. A the wire, which being drawn out permits the urine to flow through the opening B. C the handle.

Fig. 2. Repreſents a ſmall male catheter made of ſilver like the former, having two oblong apertures in the extremity, which ought to be very ſmooth, that it may paſs freely without catching againſt the caput gallinaginis, or any other caruncles in the neck of the bladder.

Fig. 3. Repreſents a ſtaff fit to cut upon for the ſtone in boys from eight to fourteen years of age.

Fig. 4. Repreſents a ſmaller ſtaff fit for boys from about four to eight years of age, but is too large for the ſmalleſt children. The ſtaves are made of ſteel with a groove on the convex ſide, which ſerves to direct and receive the point of the knife in cutting, and afterwards to guide the beak of the gorget (*Fig.* 6.) into the bladder. Of theſe there ſhould be two more ſizes, one leſs than *Fig.* 4. for infants, and one larger than *Fig.* 3.

TAB. Y.

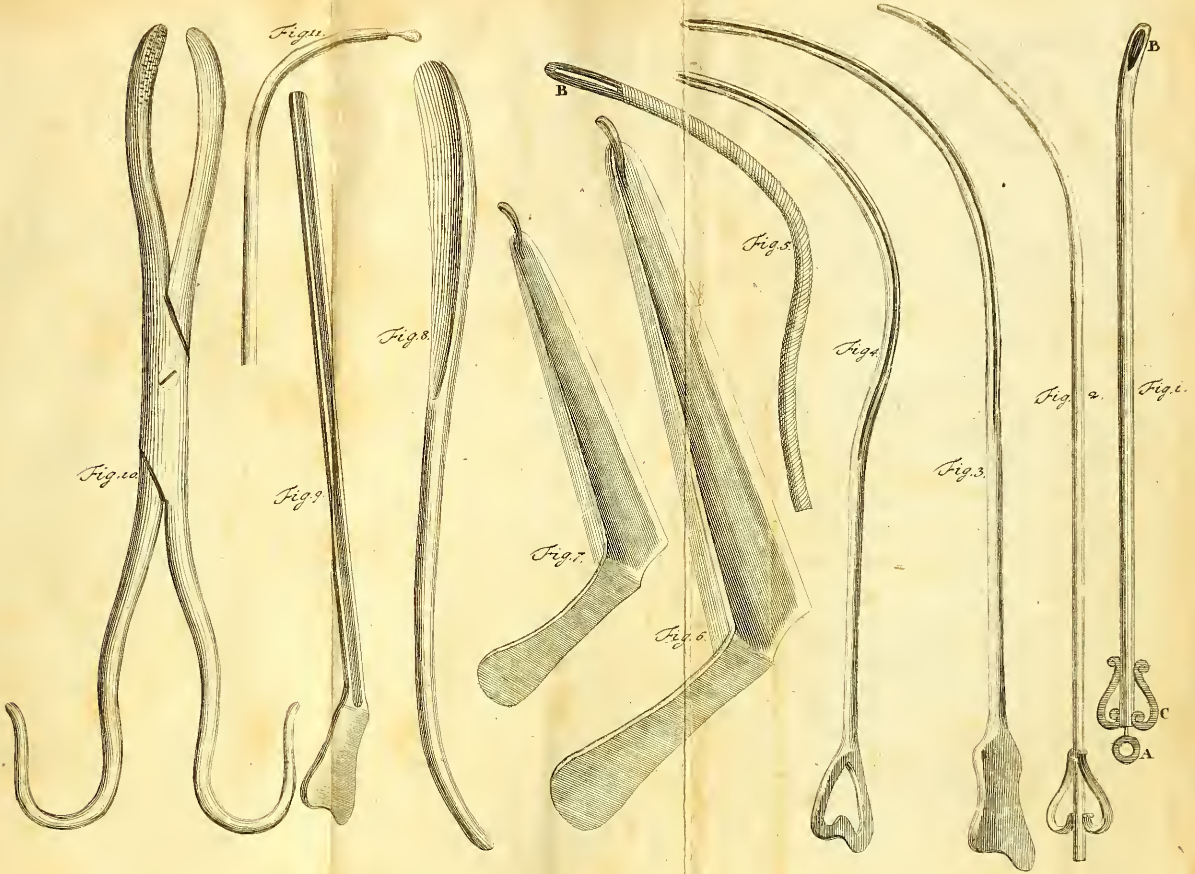
Fig. 11.
Fig. 10.
Fig. 9.
Fig. 8.
B
Fig. 7.
Fig. 6.
Fig. 5.
Fig. 4.
Fig. 3.
Fig. 2.
Fig. 1.
B
C
A

for men full grown. The edges of the grooves ſhould be ſmooth and rounding, that they may not cut the urethra; and the groove ſhould be continued quite through the end of the ſtaff, that it may not be apt to catch the point of the gorget.

Fig. 5. Repreſents the half of a flexible catheter made in the ſhape of that at *Fig.* 2. only compoſed of a ſtrong flattened wire, which being introduced into the bladder, ſupported by the ſtrong ſilver wire which it includes, adapts itſelf eaſily to the figure of the urethra, ſo that it may be left a conſiderable time in the bladder to give a diſcharge to the urine, and prevent it from eſcaping through the wound in perinæo, which is apt to become callous, and very difficult to cure from that cauſe.

Fig. 6. Repreſents a gorget fit for men in the lateral operation for the ſtone.

Fig. 7. Denotes a gorget for children under five years of age; and one of a ſize betwixt theſe two will ſuit boys from five to fifteen years of age. Theſe inſtruments are hollow for the paſſage of the forceps into the bladder, and their handles lie ſlanting, that they may the more readily be carried through the wound of the proſtate, which is made obliquely on the left ſide of it. The beak at the extremity of the gorget muſt be ſmaller than the groove of the ſtaff which is cut upon, becauſe it is to be received into the groove. Care ſhould be taken that the edges of the gorget near the beak are not ſharp, leſt inſtead of dilating the wound, as it ought, it ſhould only cut on each ſide when introduced; in which caſe it would be difficult to carry the forceps into the bladder.

Fig. 8. Repreſents a ſteel ſcoop to extract the ſtone when it is broke into ſmall fragments: the ſmall end ſerving to ſearch for a ſtone in the bladder through the wound which is made into it.

Fig. 9. Denotes a ſteel director to conduct the gorget through the urethra in extracting the ſtone from women with or without cutting.

Fig. 10. Repreſents a pair of ſtone forceps, of which there ſhould be ſeveral ſizes agreeable to the age and ſtone to be extracted: and therefore there ſhould be four or five from the ſize of that in the table to about a foot long. Mr. *Sharp* obſerves of theſe forceps, that they ought to be made ſo as not to meet cloſe at the extremities when they are ſhut; that the teeth ſhould not be ſo large as to break the ſtone, nor ſeated too near the hinge, which ſhould be made to move freely.

Fig. 11. Repreſents half a catheter without lateral apertures at the extremity, as in *Fig.* 2. having only a circular opening at the end, which is ſhut up in the introduction of it by the globular button of the included wire, which is never extracted in this inſtrument as it is in the others (*Fig.* 1, 2.); but when it is paſſed into the bladder, the wire is thruſt forward, by which means the button is removed from the extremity, and a free paſſage is made for the urine. This is ſaid to paſs more eaſily through the urethra without wounding or catching againſt its ſides.

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FINIS.

Bandon

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Saily Morris
Molly Morris
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